GE ENERGY SERVICES

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VOC OVERALL REDUCTION EFFICIENCY STUDY

Performed At
Ferrara Pan Candy Company
Forest Park Plant
Catalytic Oxidizer
Forest Park, Illinois

Prepared For
Mostardi Platt Environmental

Test Dates
June 26, 2003

Report No.
GE Mostardi Platt Report M22E0133A
Revision 0

Report Submittal Date
July 16, 2003

CERTIFICATION SHEET

Having reviewed the test program described in this report, I hereby certify the data, information, and results in this report to be accurate and true according to the methods and procedures used.

Data collected under the supervision of others is included in this report and is presumed to have been gathered in accordance with recognized standards.

GE MOSTARDI PLATT

Scott W. Banach

Scott W. Banach
Director, Project Engineering

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1.0 INTRODUCTION

GE MOSTARDI PLATT, a division GE Energy and Industrial Services, Inc. (GE Mostardi Platt) performed a volatile organic compound (VOC) overall reduction efficiency test program on the catalytic oxidizer at the Forest Park Plant of Ferrara Pan Candy Company (Ferrara Pan) in Forest Park, Illinois, on June 26, 2003 for Mostardi Platt Environmental. The tests were authorized by Ferrara Pan and performed for Mostardi Platt Environmental.

The purpose of this test program was to determine the VOC destruction efficiency during normal operating conditions with tests performed at the oxidizer inlet and outlet. An evaluation of the permanent total enclosure was also made to verify 100% capture.

1.1 Project Contact Information

Location	Address	Contact
Test Facility	Ferrara Pan Candy Company 7301 West Harrison Street Forest Park, Illinois 60130	Mr. Albert Maronta 708-366-0500
Testing Coordinator	Mostardi Platt Environmenta 1520 Kensington Road Suite 204 Oakbrook, Illinois 60523-2139l	Mr. Britt Wenzel 630-993-2100 bwenzel@mostardiplattenv.com

Location	Address	Contact
Testing Company Representative	GE Mostardi Platt 888 Industrial Drive Elmhurst, Illinois 60126	Mr.Eric L. Ehlers Project Manager 630-530-6621 (phone) 630-530-6630 (fax) eric.ehlers@ps.ge.com

The tests were conducted by Messrs. S. Burton, J. Halla, A. Sakellariou, T. Barr, D. Thompson and E. Ehlers of GE Mostardi Platt.

2.0 SUMMARY OF RESULTS

During this test program, four (4), one-hour volatile organic compound (VOC) tests were performed simultaneously at the catalytic oxidizer inlet and outlet test locations. Destruction efficiency averaged 96.90%. Complete test results for the catalytic oxidizer test locations are given on page 9.

The enclosures surrounding the big chocolate room coating system, west polishing room coating system, Ferrara Pan chocolate room coating system and the mint room coating system met all four criteria required by the United States Environmental Protection Agency (USEPA) to qualify as a 100% permanent total enclosure (PTE). USEPA Method 204 results are appended. The overall reduction efficiency was then 96.90%.

3.0 DISCUSSION OF RESULTS

Four (4), one-hour VOC tests were run simultaneously on the catalytic oxidizer inlet and outlet test location. Tedlar bags were filled during each run at the inlet and outlet of the oxidizer in order to subtract methane and ethane concentrations from the results of the total hydrocarbon testing. Test one (1) is not included in the averages as the system was not running at normal conditions throughout the test run.

No problems were encountered with the testing equipment during the test program. Source operation appeared normal during the entire test program.

4.0 TEST PROCEDURES

All testing, sampling, analytical, and calibration procedures used for this test program were performed as described in the Title 40, *Code of Federal Regulations*, Part 60 (40CFR60), Appendix A, Methods 1 through 4, 18, 25A, and Part 51 (40CFR51), Appendix M, Method 204, and the latest revisions thereof. Where applicable, the *Quality Assurance Handbook for Air Pollution Measurement Systems*, Volume III, Stationary

Source Specific Methods, United States Environmental Protection Agency (USEPA) 600/4-77-027b was used to determine the precise procedures.

4.1 Volumetric Flowrate Determination

In order to determine the emission rate on a lbs/hr basis, the gas velocity and volumetric flowrate were determined using Method 2, 40CFR60.

Velocity pressures were determined by traversing the test locations with S-type pitot tubes. Temperatures were measured using a K-type thermocouple with a calibrated digital temperature indicator. The molecular weight and moisture content of the gases were determined to permit the calculation of the volumetric flowrate. Sampling points utilized were determined using Method 1, 40CFR60.

4.2 Oxygen (O_2)/Carbon Dioxide (CO_2) Determination

Oxygen (O_2) and carbon dioxide (CO_2) gas contents were determined in accordance with Method 3, 40CFR60. This method analyzed samples collected in a grab manner using a Hays Orsat gas analyzer. Several gas extractions were performed during each test run to ensure a stable reading. Mandatory leak checks were performed prior to and following each use. Chemicals are changed frequently and inspected for reactivity prior to each use.

4.3 Moisture (H_2O) Determination

Determining the moisture content in the gas stream is necessary to calculate the stack gas volumetric air flow on a dry basis and the emission rate in lbs/hr. For this purpose, GE Mostardi Platt used two methods.

1. American National Standards Institute (ANSI)/American Standard Testing Method (ASTM) Method E337-62 reapproved 1979, wet bulb/dry bulb measurements were made at the inlet duct during each sampling run and the water vapor content was calculated as follows:

$$Bws = \left[\frac{e' - AP(t - t')}{P}\right]$$

where:

e' = saturated vapor pressure of water, in. Hg, at the wet bulb temperature, t'

$A = 3.67 \times 10^{-4}\left[1 + 0.00064(t' - 32)\right]$

P = absolute pressure, in. Hg, in the duct

t = dry bulb temperature, °F

t' = wet bulb temperature, °F

2. At the catalytic oxidizer outlet, *An Alternative Method for Stack Gas Moisture Determination*, written by John Stanley and Peter Westlin, August 1978, Emission Measurement Branch, USEPA, was utilized. The sampling equipment was the same as specified for the moisture approximation method in Method 4, 40CFR60, except for the addition of two impingers, one containing silica gel.

   Approximately 15 mls of water were added to each of the first two impingers and the third was left empty. An impinger containing approximately 15 grams of silica gel and a glass-wool-packed outlet was attached following the third impinger. The entire impinger train, excluding the inlet and outlet connectors, was weighed to the nearest 0.05 gram. The impingers were placed in an ice bath to maintain the sampled gas passed through the silica gel impinger outlet below 68°F. Maintaining the temperature increases the accuracy of the sampled dry gas volume measurement. Each sample was extracted through a stainless steel probe at a constant sample rate of between one to four liters per minute, which was maintained during the course of the other simultaneous reference method sampling. An adequate volume was drawn to ensure accuracy. A minimum of the equivalent to one gram of moisture must be collected to acquire that accuracy. After each test run, a leak check of the sample train was performed at a vacuum greater than the sampling vacuum to determine if any leakage had occurred during sampling. Following the leak check, the impingers were removed from the ice bath and allowed to warm. Any condensed moisture on the exterior was removed and the train reweighed.

4.4 Methane (CH_4) and Ethane (C_2H_6) Determination

The Method 18, 40CFR60, sampling and measurement system meets the requirements for stack sampling of gaseous organic compounds set forth by the USEPA. In particular, it meets the requirements of USEPA Reference Method 18, "Determination of Gaseous Organic Compound Emissions by Gas Chromatography," 40CFR60, Appendix A. This method applies to the analysis of approximately 90% of the total gaseous organics emitted from an industrial source. The major organic components of a gas mixture are separated by gas chromatography and methane and ethane are quantified by a flame ionization detector (FID).

The gas chromatograph used during this program was a Varian 3400 with a FID. This instrument was calibrated using ultra-zero air and methane (CH_4) and ethane (C_2H_6) in nitrogen certified standards. The calibrations were performed before and after sampling with calibration checks performed each day. Sample times and locations were logged on integrator printouts.

4.5 Total Organic Concentration Determination

Method 25A, 40CFR60, sampling and measurement system meets the requirements for stack sampling of volatile organic compounds (VOCs) set forth by the USEPA. In particular, it meets the requirements of USEPA Reference Method 25A, "Determination of Total Gaseous Organic Concentration Using a Flame Ionization Analyzer," 40CFR60, Appendix A. This method applies to the measurement of total gaseous organic concentration of hydrocarbons. With this method, gas samples were extracted from the inlet and stack through heated Teflon® sample lines to the analyzers.

The flame ionization detectors (FIDs) used during this program were JUM Model VE-7 High-Temperature Total Hydrocarbon Analyzers. They are highly sensitive FIDs that provide a direct reading of total organic vapor concentrations with linear ranges of 0-10, 100, 1000 and 10,000 ppm by volume. The instruments were calibrated using ultra-zero air and propane in air certified standards. The calibrations were performed before and after sampling with calibration checks performed between each test run. Sampling was conducted continuously for three one-hour periods. Sample times and locations were logged simultaneously on data loggers. Final concentrations were determined by subtracting the methane and ethane analysis from the Method 18, 40CFR60.

4.6 Enclosure Criteria and Techniques (PTE)

4.6.1 NDO Distance to Emitting Point (PTE)

Criteria: All NDOs such as open doorways, windows, etc. must be at least four equivalent NDO diameters from the nearest potential VOC emitting point.

Technique: The dimensions of all NDOs and distances to potential emitting points are measured. The calculated NDO equivalent diameters are compared to the emitting point distances measured.

4.6.2 Total NDO Area (PTE)

Criteria: The area of all NDOs divided by the total area of all walls, floors and ceilings in the enclosure (called the "NEAR" ratio in the procedure) must not exceed 0.05.

Technique: The measured surfaces were used to determine a composite surface area of the enclosure and the normally open NDOs and the NEAR ratio was determined.

4.6.3 Velocity of Airflow through NDO (PTE)

Criteria: The calculated face velocity through the NDOs must be greater than 200 feet per minute (fpm). This is defined as the total exhaust volume (in scfm), less make up air, divided by the area of all NDOs (in square feet). Alternately, the static pressure of the PTE can be measured. A negative draft pressure of 0.007 inches H_2O is equivalent to a face velocity of 200 feet per minute.

Technique: The static pressure of the PTE was measured to verify if it meets the -0.007 inches H_2O criteria.

4.6.4 Direction of Airflow through NDO (PTE)

Criteria: The direction of airflow through all NDOs must be into the enclosure.

Technique: A velometer was used at each normally open NDO to measure the direction of the airflow. A record of this data was made on the Procedure T data sheet, appended.

4.7 EVALUATION RESULTS (PTE)

The four (4) enclosures must meet all of the following four (4) requirements to qualify as a PTE. As currently configured, the enclosures geometries compare to Method 204 criteria as follows:

4.7.1 Big Chocolate Room

4.7.1.1 Equivalent Diameters: NDO to VOC Emitting Point (PTE)

A list of minimum and current NDO to VOC emitting point distances are listed below:

NDO	Dimensions	Equivalent Diameter	VOC Emission Point	Distances		Pass/Fail?
				Minimum	Actual	
Exit Door NDO #1	1" x 6'6"	10.0"	Food Grade Alcohol Coater	40"	186"	Pass
Exit Door NDO #2	2" x 3'6"	10.3"	Food Grade Alcohol Coater	41.4"	186"	Pass
Hole in Floor NDO #3	16" Diameter	16"	Food Grade Alcohol Coater	64"	264"	Pass

$$\text{Equivalent Diameter} = \left(\frac{4 \times \text{area}}{\pi}\right)^{0.5}$$

Minimum Allowed Distance = 4 × Equivalent Diameter (NDO)

4.7.1.2 NDO to Enclosure Area Ratio (PTE)

The calculated NEAR ratio of the room is 0.0006. The calculation is as follows:

	$A_N/A_T \leq 0.05$			
where:	A_N	= Area of normally open NDOs	=	6.707
	A_T	= Total Area of enclosure	=	11,094.52
	$\therefore$	A_N 6.707 ÷ A_T 11,094.52	=	0.0006

Because the calculated NEAR is less than the maximum allowable ratio of 0.05, the enclosure meets the requirements of this section.

4.7.1.3 NDO Facial Velocity Determinations (PTE)

The static pressure of the PTE was measured using a micromanometer. The negative pressure in the enclosure was an average of -0.023 inches H_2O. This meets the -0.007 inches H_2O criteria.

4.7.1.4 NDO Air Flow Direction (PTE)

The air flow, verified using a velometer, through all of the normally open NDOs was into the enclosure.

4.7.2 West Polishing Room

4.7.2.1 Equivalent Diameters: NDO to VOC Emitting Point (PTE)

A list of minimum and current NDO to VOC emitting point distances are listed below:

NDO	Dimensions	Equivalent Diameter	VOC Emission Point	Distances		Pass/Fail?
				Minimum	Actual	
Exit Door 1 NDO 1	0.25" x 8.25"	1.6"	Food Grade Alcohol Coater	6.5"	90"	Pass
Exit Door 1 NDO 2	0.25" x 8.25"	1.6"	Food Grade Alcohol Coater	6.5"	90"	Pass
Exit Door 1 NDO 3	1.5" x 12"	4.8"	Food Grade Alcohol Coater	19.2"	90"	Pass
Exit Door 1 NDO 4	0.125" x 30"	2.2"	Food Grade Alcohol Coater	8.7"	90"	Pass
Exit Door 2 NDO 5	0.25" x 8"	1.6"	Food Grade Alcohol Coater	6.5"	90"	Pass
Exit Door 2 NDO 6	0.25" x 8"	1.6"	Food Grade Alcohol Coater	6.5"	90"	Pass
Exit Door 2 NDO 7	0.125" x 30"	2.2"	Food Grade Alcohol Coater	8.7"	90"	Pass

$$\text{Equivalent Diameter} = \left(\frac{4 \times \text{area}}{\pi}\right)^{0.5}$$

Minimum Allowed Distance = 4 × Equivalent Diameter (NDO)

4.7.2.2 NDO to Enclosure Area Ratio (PTE)

The calculated NEAR ratio of the room is 0.00003. The calculation is as follows:

	$A_N/A_T \leq 0.05$			
where:	A_N	= Area of normally open NDOs	=	0.233
	A_T	= Total Area of enclosure	=	8,096.83
	$\therefore$	A_N 0.233 ÷ A_T 8,096.83	=	0.00003

Because the calculated NEAR is less than the maximum allowable ratio of 0.05, the enclosure meets the requirements of this section.

4.7.2.3 NDO Facial Velocity Determinations (PTE)

The static pressure of the PTE was measured using a micromanometer. The negative pressure in the enclosure was -0.018 inches H_2O. This meets the -0.007 inches H_2O criteria.

4.7.2.4 NDO Air Flow Direction (PTE)

The air flow, verified using a velometer, through all of the normally open NDOs was into the enclosure.

4.7.3 Ferrara Pan Chocolate Room

4.7.3.1 Equivalent Diameters: NDO to VOC Emitting Point (PTE)

A list of minimum and current NDO to VOC emitting point distances are listed below:

NDO	Dimensions	Equivalent Diameter	VOC Emission Point	Distances		Pass/Fail?
				Minimum	Actual	
Exit Door NDO #1	1" x 6'	9.58"	Food Grade Alcohol Coater	38.3"	144"	Pass

$$\text{Equivalent Diameter} = \left(\frac{4 \times \text{area}}{\pi}\right)^{0.5}$$

Minimum Allowed Distance = 4 × Equivalent Diameter (NDO)

4.7.3.2 NDO to Enclosure Area Ratio (PTE)

The calculated NEAR ratio of the room is 0.0001. The calculation is as follows:

$A_N/A_T \leq 0.05$

where:	A_N	= Area of normally open NDOs	=	0.500
	A_T	= Total Area of enclosure	=	4,063.00
	$\therefore$	A_N 0.500 ÷ A_T 4,063 =	0.0001	

Because the calculated NEAR is less than the maximum allowable ratio of 0.05, the enclosure meets the requirements of this section.

4.7.3.3 NDO Facial Velocity Determinations (PTE)

The static pressure of the PTE was measured using a micromanometer. The negative pressure in the enclosure was an average of -0.011 inches H_2O. This meets the -0.007 inches H_2O criteria.

4.7.3.4 NDO Air Flow Direction (PTE)

The air flow, verified using a velometer, through all of the normally open NDOs was into the enclosure.

4.7.4 Mint Room

4.7.4.1 Equivalent Diameters: NDO to VOC Emitting Point (PTE)

A list of minimum and current NDO to VOC emitting point distances are listed below:

NDO	Dimensions	Equivalent Diameter	VOC Emission Point	Distances		Pass/Fail?
				Minimum	Actual	
Exit Door 1 NDO 1	1" x 8'	11.1"	Food Grade Alcohol Coater	44.4"	144"	Pass

$$\text{Equivalent Diameter} = \left(\frac{4 \times \text{area}}{\pi}\right)^{0.5}$$

Minimum Allowed Distance = 4 × Equivalent Diameter (NDO)

4.7.4.2 NDO to Enclosure Area Ratio (PTE)

The calculated NEAR ratio of the room is 0.00008. The calculation is as follows:

	$A_N/A_T \leq 0.05$			
where:	A_N	= Area of normally open NDOs	=	0.667
	A_T	= Total Area of enclosure	=	8,256.00
	$\therefore$	A_N 0.667 ÷ A_T 8,256 =		0.00008

Because the calculated NEAR is less than the maximum allowable ratio of 0.05, the enclosure meets the requirements of this section.

4.7.4.3 NDO Facial Velocity Determinations (PTE)

The static pressure of the PTE was measured using a micromanometer. The negative pressure in the enclosure was –0.009 inches H_2O. This meets the -0.007 inches H_2O criteria.

4.7.4.4 NDO Air Flow Direction (PTE)

The air flow, verified using a velometer, through all of the normally open NDOs was into the enclosure.

Calculations were performed on computer and by hand. An explanation of the nomenclature and calculations along with the complete test results is included in the appendix. Also appended are calibration data and copies of the raw field data sheets.

Sample recovery was performed at the test site by the test crew. Initial and final analyses were performed at the GE Mostardi Platt laboratory in Elmhurst, Illinois. Copies of all sample analysis sheets are appended to this report.

Raw data are kept on file at the GE Mostardi Platt office in Elmhurst, Illinois. All samples from this test program (not already used in analysis) will be retained for 60 days after the submittal of the report, after which they will be discarded unless GE Mostardi Platt is advised otherwise.

5.0 QUALITY ASSURANCE PROCEDURES

GE Mostardi Platt recognizes the previously described reference methods to be very technique oriented and attempts to minimize all factors which can increase error by implementing its Quality Assurance Program into every segment of its testing activities.

Dry and wet test meters were calibrated according to methods described in the Quality Assurance Handbook, Sections 3.3.2, 3.4.2 and 3.5.2. Percent error for the wet test meter according to the methods was less than the allowable error of 1.0 percent. The dry test meters measured the test sample volumes to within 2 percent at the flowrate and conditions encountered during sampling.

Calibration gases were Protocol One gases.

6.0 TEST RESULTS SUMMARY

Ferrara Pan Candy
Catalytic Oxidizer
Forest Park, Illinois
June 26, 2003

Method 25A VOC Results Summary									
Position	Test No.	Time	Airflow (dscfm)	Temp (°F)	Moisture Corr (1-Bws)	VOC Conc (ppmvd as C_3H_8)	Methane Conc (ppmvd)	Non Methane VOC Conc (ppmvd as C_3H_8)	VOC Emission Rate (lbs C_3H_8/hr)
Prime Oxidizer Inlet	2	710-810	7,437	73.5	0.980	240.6	2.4	239.8	12.22
	3	820-845/ 855-930	7,245	73.0	0.980	261.1	2.5	260.3	12.92
	4	1115-1215	6,929	73.0	0.980	307.3	2.5	306.5	14.55
	Average		7,204	73.2	0.980	269.7	2.5	268.9	13.23
Prime Oxidizer Outlet	2	710-810	7,201	200.8	0.976	8.3	5.1	6.6	0.33
	3	820-845/ 855-930	6,954	199.0	0.971	9.7	4.3	8.3	0.40
	4	1115-1215	7,261	202.3	0.973	11.6	4.5	10.1	0.51
	Average		7,139	200.7	0.973	9.9	4.6	8.4	0.41

Destruction Efficiency Summary			
Test No.	Inlet (lbs C_3H_8/hr)	Outlet (lbs C_3H_8/hr)	Efficiency (%)
1	12.22	0.33	97.30
2	12.92	0.40	96.90
3	14.55	0.51	96.49
Average	13.23	0.41	96.90

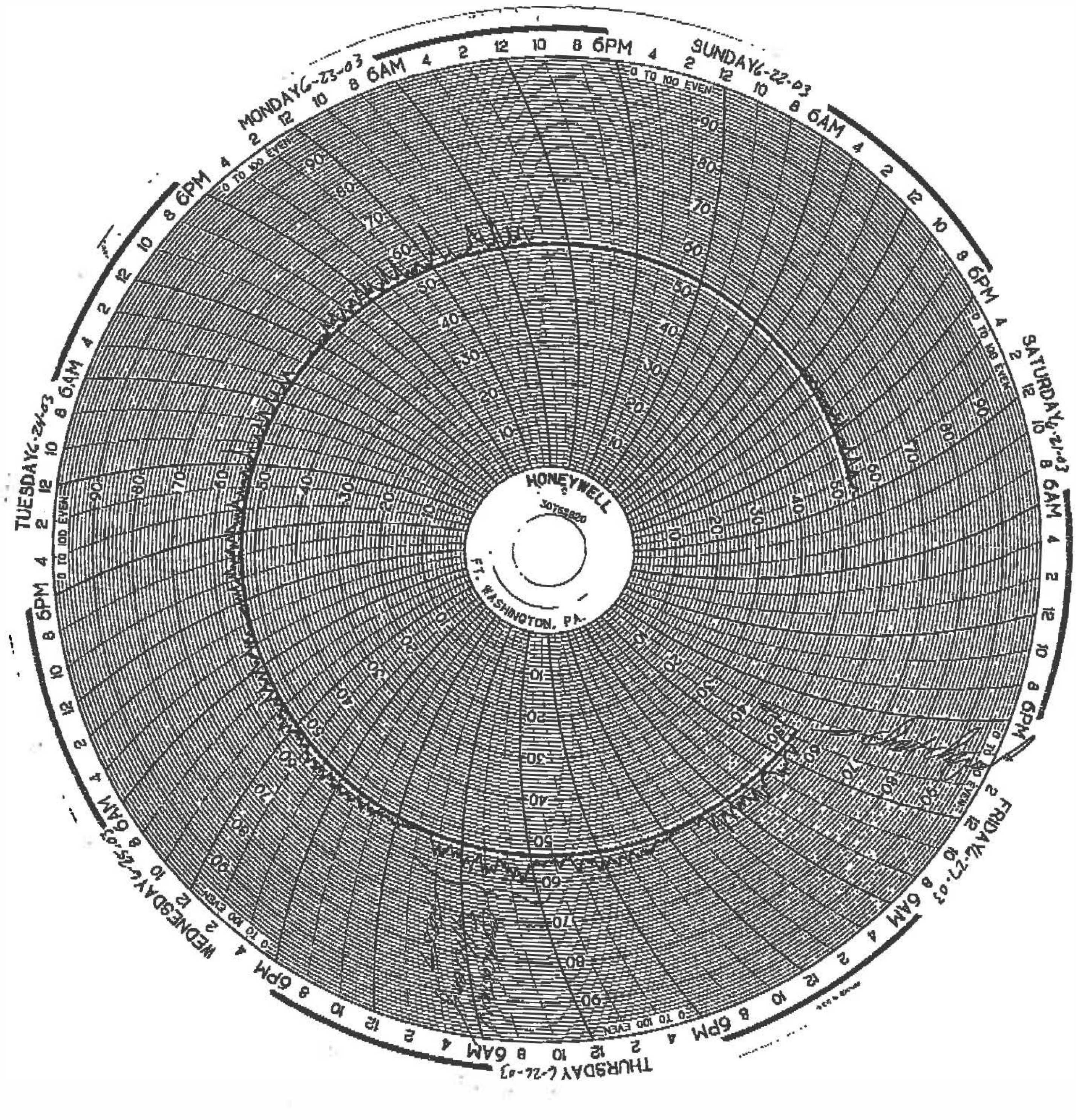
$$\text{VOC ppmvd as } C_3H_8 = \text{observed ppm, Wet} \times \frac{1}{(1 - \text{Bws})}$$

$$\text{Non Methane VOC as } C_3H_8 = \text{VOC ppmvd as } C_3H_8 - \left(\frac{\text{Methane}}{3}\right)$$

$$\text{Emission Rate (lbs/hr)} = \frac{\text{Concentration (ppmvd as } C_3H_8)}{8.7573 \times 10^6} \times \text{dscfm} \times 60$$

$$\text{Destruction Efficiency(\%)} = \frac{\text{Inlet}(\text{lbs}C_3H_8/\text{hr}) - \text{Outlet}(\text{lbs}C_3H_8/\text{hr})}{\text{Inlet}(\text{lbs}C_3H_8/\text{hr})} \times 100$$

APPENDIX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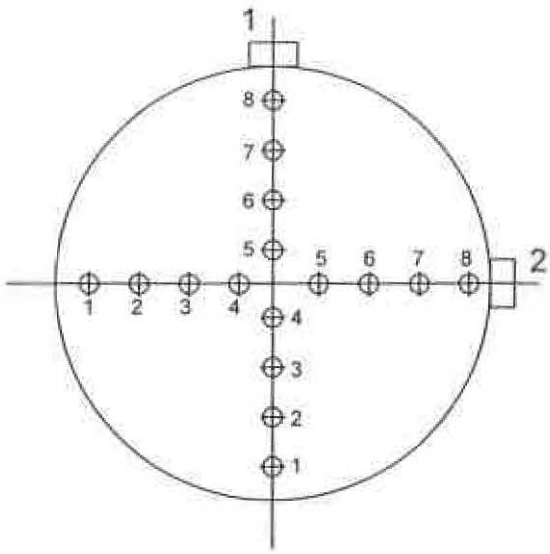
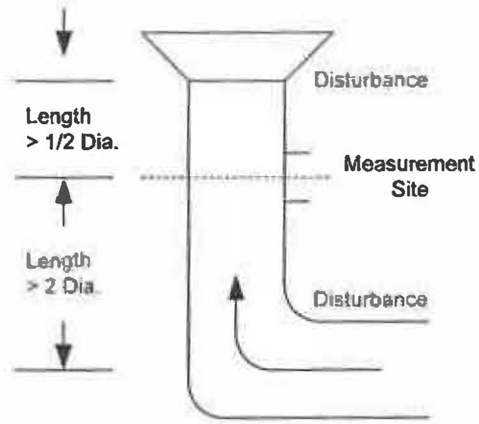
MONDAY 6-23-03
TUESDAY 6-24-03
WEDNESDAY 6-25-03
THURSDAY 6-26-03
FRIDAY 6-27-03
SATURDAY 6-21-03
6AM
6PM
0 TO 100 EVEN
HONEYWELL
FT. WASHINGTON, PA.

EQUAL AREA TRAVERSE FOR ROUND DUCTS

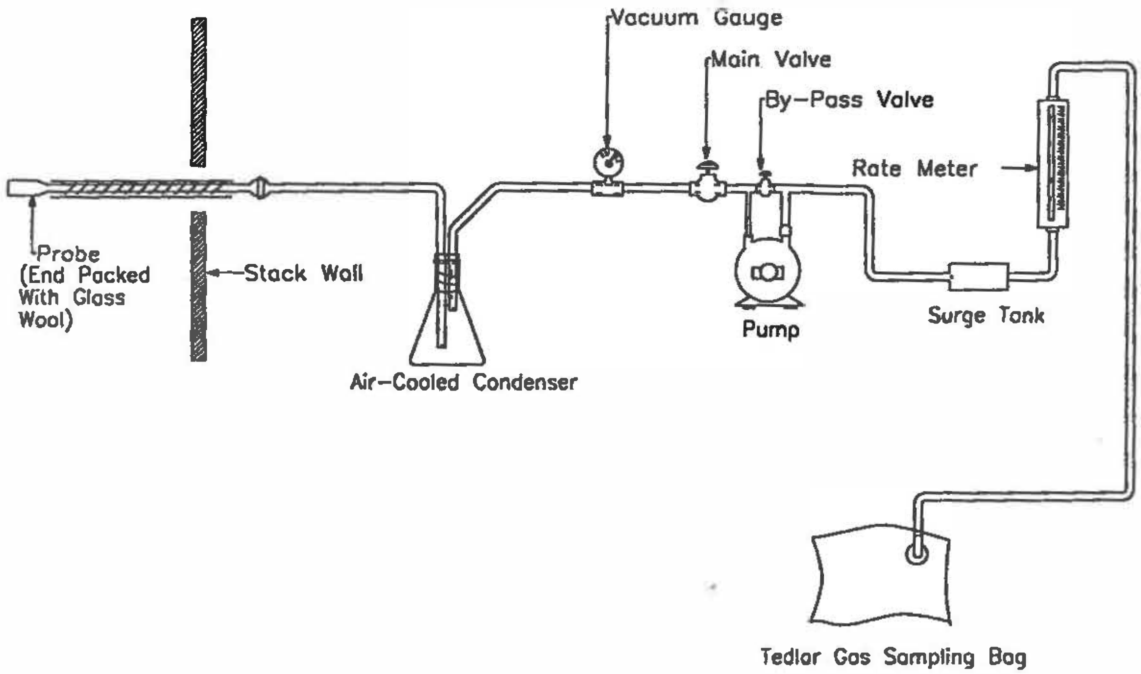




Job:	Ferrara Pan Candy Company Forest Park, Illinois
Date:	June 26, 2003
Unit No:	Catalytic Oxidizer
Duct No:	Inlet
Duct Diameter:	30 Inches
Duct Area:	4.91 Square Feet
No. Points Across Diameter:	8
No. of Ports:	2

Sampling Train for Integrated Gas Sampling

USEPA Method 3



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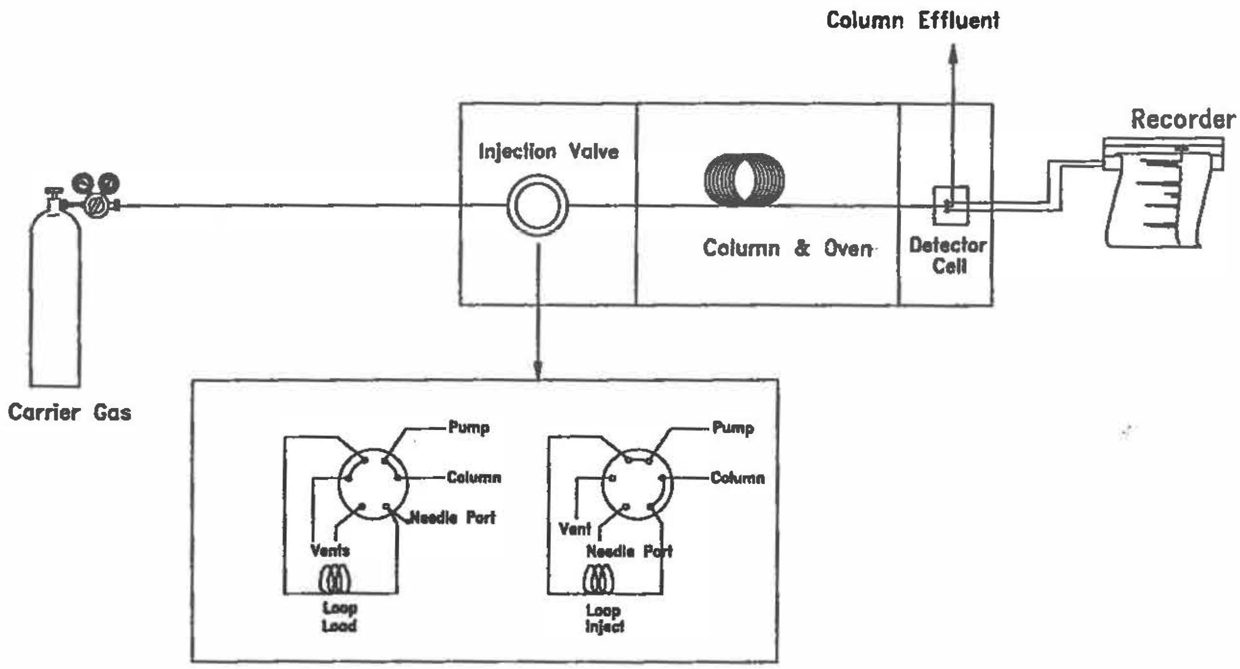
Measurement of Gaseous Organic Compound Emissions By Gas Chromatography

USEPA Method 18



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Method 18

Analysis for Methane and Ethane Calibration

Beginning of Day Mid Calibration Check

Date Analyzed	06/27/03	
Analyst:	DJS	

Project No:	M22E0133-01
Client/Loc:	Ferrara Pan

Lo-Range	24.9	25.1
Run #	Methane	Ethane
1	791472	1505997
2	784843	1499655
3	790189	1502800
Average	788835	1502817
%RSD	0.45	0.21
RF	31680	59873
Mid-Range	50.9	50
Run #	Methane	Ethane
1	1621639	3019537
2	1624256	3018344
3	1647188	3054541
Average	1631028	3030807
%RSD	0.86	0.68
RF	32044	60616
Hi-Range	101	100
Run #	Methane	Ethane
1	3160082	5951798
2	3163454	5964006
3	3144356	5925914
Average	3155964	5947239
%RSD	0.32	0.33
RF	31247	59472
Ave. RF	31657	59987
% Drift	0.98	1.07
%RSD	1.26	0.97

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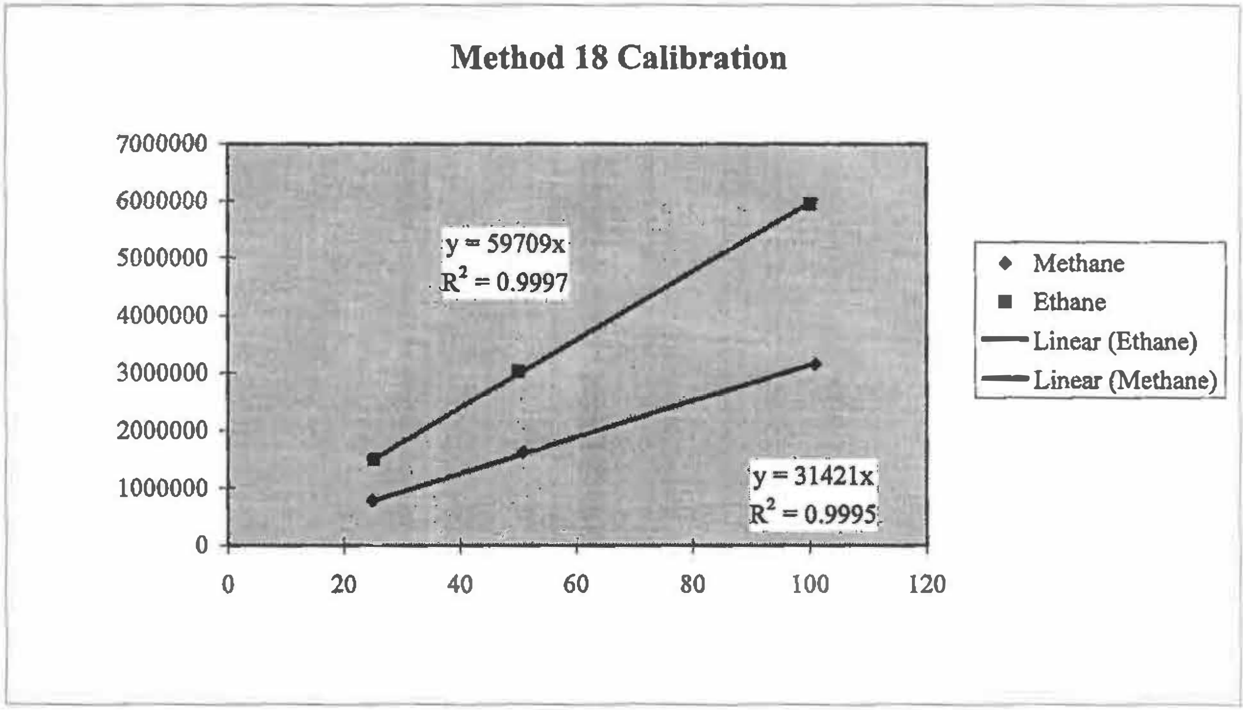

	24.9	25.1	50.9	50	101	100
Methane	788835		1631028		3155964	
Ethane		1502817		3030807		5947239

Carrier Gas

Type	Helium, UHP
Flowrate	30 mL/min
Pressure	22.5 psi

Plotter Section

Plot Speed	0.5 cm/min
Zero Offset	15%
Plot Signal	A
Time Ticks?	Yes
Instrument Event Codes	Yes
User Number	Not used (0-0)
Print User Number	No
Print Report	Yes
Print Run Log	No

Integration

Run Mode	1 (analysis)
Peak Measurement Parameter	1 (area)
Long Report Format	No
Result Calculation Type	1 (area %)
Divisor	1.000
Amount Standard	1.000
Mutliplier	1.000
Result Units	left blank
Report Unidentified Peaks	Yes
Unidentified Peak factor	0.000
Sample ID	
Subtract Blank Baseline	No
Peak Reject Value	1000
Signal To Noise Ratio	5
Tangent Peak Width	10
Initial Peak Width	8

Method 18

Analysis for Methane and Ethane Calibration
Three Point Calibration

Cal Date: 6/19/2003
Analyst: DJS

Lo-Range	24.9	25.1
Run #	Methane	Ethane
1	791472	1505997
2	784843	1499655
3	790189	1502800
Average	788835	1502817
%RSD	0.45	0.21
RF	31680	59873
Mid-Range	50.9	50.0
Run #	Methane	Ethane
1	1588544	2947099
2	1586195	2936019
3	1578305	2922461
Average	1584348	2935193
%RSD	0.34	0.42
RF	31127	58704
Hi-Range	101	100.0
Run #	Methane	Ethane
1	3160082	5951798
2	3163454	5964006
3	3144356	5925914
Average	3155964	5947239
%RSD	0.32	0.33
RF	31247	59472
Ave. RF	31351	59350
%RSD	0.93	1.00

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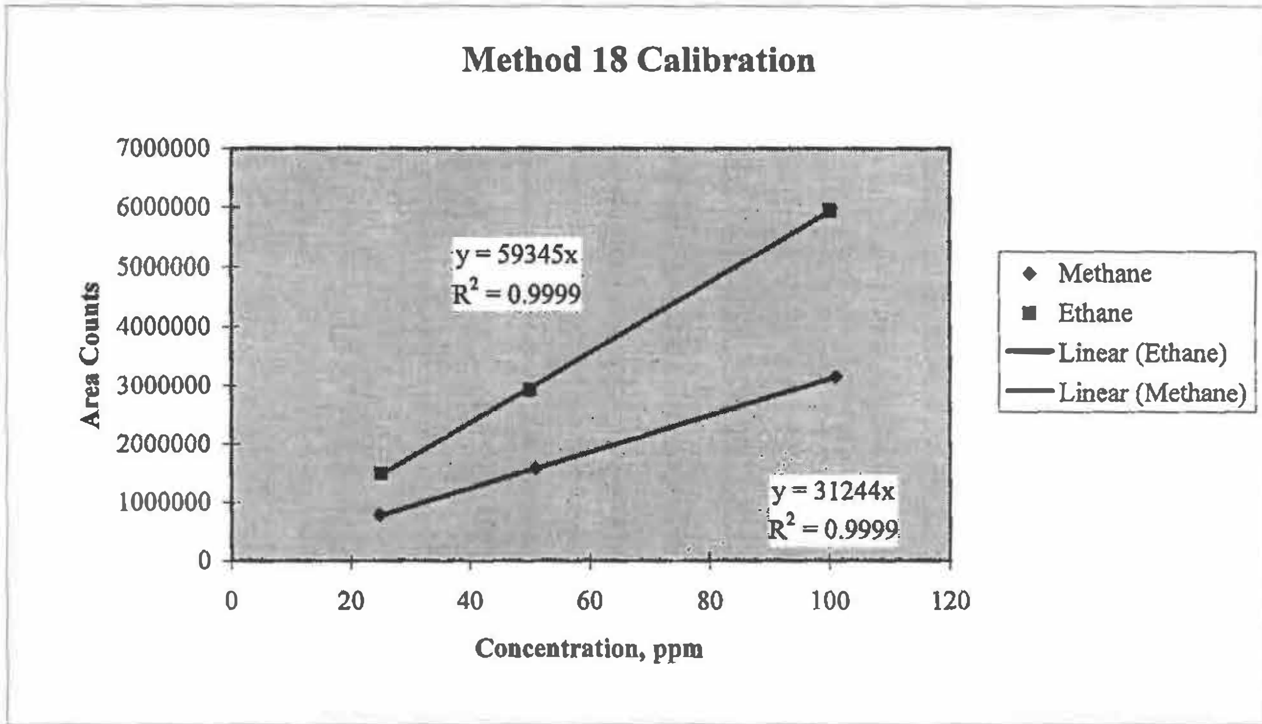


	24.9	25.1	50.9	50	101	100
Methane	788835		1584348		3155964	
Ethane		1502817		2935193		5947239

Method 18

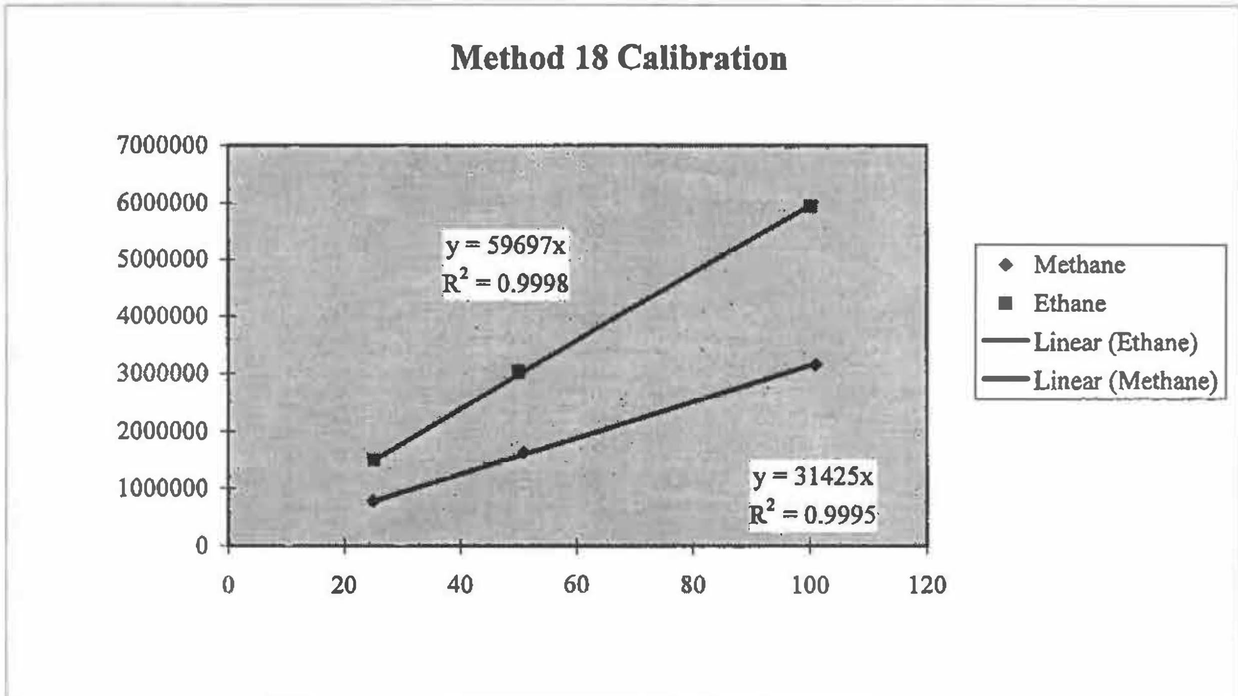
Analysis for Methane and Ethane Calibration
End of Day Mid Calibration Check

Date Analyzed 06/27/03
Analyst: DJS

Project No: M22E133-01
Client/Loc: Ferrara Pan

29

Lo-Range	24.9	25.1
Run #	Methane	Ethane
1	791472	1505997
2	784843	1499655
3	790189	1502800
Average	788835	1502817
%RSD	0.45	0.21
RF	31680	59873
Mid-Range	50.9	50
Run #	Methane	Ethane
1	1625325	3016529
2	1627056	3022460
3	1643699	3044055
Average	1632027	3027681
%RSD	0.62	0.48
RF	32063	60554
Hi-Range	101	100
Run #	Methane	Ethane
1	3160082	5951798
2	3163454	5964006
3	3144356	5925914
Average	3155964	5947239
%RSD	0.32	0.33
RF	31247	59472
Ave. RF	31664	59966
% Drift	1.00	1.04
%RSD	1.29	0.91



	24.9	25.1	50.9	50	101	100
Methane	788835		1632027		3155964	
Ethane		1502817		3027681		5947239

SUMMARY OF RESULTS CALCULATIONS

$$Vm\,(std) = 17.647 \times Vm \times \left[\frac{P_{bar} + \frac{DH}{13.6}}{(460 + Tm)} \right] \times Y$$

$$Vw\,(std) = 0.0471 \times Vlc$$

Vlc = water + silica net

$$Bws = \left[\frac{Vw\,(std)}{Vw\,(std) + Vm\,(std)} \right]$$

$$Md = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + [0.28 \times (100 - \%CO_2 - \%O_2)]$$

$$MS = Md \times (1 - Bws) + (18 \times Bws)$$

$$Vs = \sqrt{\frac{(Ts + 460)}{Ms \times Ps}} \times \sqrt{DP} \times Cp \times 85.49$$

Cp = pitot tube correction factor
Ps = absolute flue gas pressure
Ms = molecular weight of gas (lb/lb mole)
Md = dry molecular weight of gas (lb/lb mole)
Bws = water vapor in gas stream proportion by volume

$$Acfm = Vs \times \text{Area (of stack or duct)} \times 60$$

$$Dscfm = Acfm \times 17.647 \times \left[\frac{Ps}{(460 + Ts)} \right] \times (1 - Bws)$$

$$Scfm = Acfm \times 17.647 \times \left[\frac{Ps}{(460 + Ts)} \right]$$

$$Scfh = Scfm \times 60 \frac{min}{hr}$$

FID - Hydrocarbon Field Data Sheet

Project: Ferrara Pan
Location:
Source: 1
2
3
Operator:
Date:

Calibration

Gas ID	Concentration	Manufacturer/Serial No.
1		
2		
3		
4		
5		

Analyzer ID:

8.7573 x10⁴

Monitor Range:
Response Time:

Chart Recorder
Span Value:
Chart Speed:

Time	1	2	3
TEST #1			
600-700			
inlet ppm =			144.1
inlet flow =			7704
	lbs/hr =		7.61
outlet ppm =			8.3
outlet flow =			9276
	lbs/hr =		.527
			93.07%
TEST #4			
1115 - 1215			
INLET ppm =			301.2
	flow =		6813
	lbs/hr =		14.06
outlet ppm =			11.3
	flow =		7695
	lbs/hr =		.596
			95.76

Time	1	2	3
TEST # 2			
	710 - 810		
inlet ppm =			235.8
inlet flow =			7512
	lbs/hr =		12.14
Outlet ppm =			8.1
Outlet flow =			7540
	lbs/hr =		0.42
			96.54%

Time	1	2	3
Test #3			
820.845/		855-930	
inlet ppm =		199.6 /	313.2 (256.…)
inlet flow =			7310
lbs/hr =			12.84
Outlet ppm =		8.1 / 10.7	9.9
Outlet flow =			7234
lbs/hr =			.466
			96.37 a/c

post 2 7062

Ppm run 2

6:49:00	192.6	10.3
6:50:00	189.3	10.2
6:51:00	174.9	9.7
6:52:00	165.4	9.2
6:53:00	156.3	8.8
6:54:00	146	8.2
6:55:00	139.1	7.2
6:56:00	132	7.2
6:57:00	129.1	7.1
6:58:00	125.6	6.9
6:59:00	122.6	7.1
7:00:00	113.7	7.5
Average	144.1	8.3
Minimum	40.6	0
Maximum	315.9	16.6

Test #1
2 of 2

```
"08:10:00,   215.5,"""",     7.8,""""""

"Average ,   235.8,"""",     8.1,""""""
"Minimum ,    96.3,"""",     1.2,""""""
"Maximum ,   511.5,"""",    21.2,""""""
```

9:09:00	268.5	10.7
9:10:00	438.2	13
9:11:00	426.2	19
9:12:00	405	15.7
9:13:00	392.4	14.6
9:14:00	385.1	11.8
9:15:00	428.2	12.7
9:16:00	431	12.9
9:17:00	398.3	13.3
9:18:00	347	11.2
9:19:00	320.3	9.6
9:20:00	312.8	8.7
9:21:00	289.4	8.7
9:22:00	275.1	8.5
9:23:00	262.1	8.6
9:24:00	249.9	8.6
9:25:00	236	8
9:26:00	224.1	7.7
9:27:00	213.3	8.2
9:28:00	201.6	8.2
9:29:00	285.8	9.4
9:30:00	525.5	19.9
Average	221.4	8.5
Minimum	66.3	4.3
Maximum	525.5	19.9

Test #3

2 of 2

12:04:00	220.8	9.1
12:05:00	211.5	8.8
12:06:00	201.8	8.5
12:07:00	199.1	8.4
12:08:00	203.6	7.6
12:09:00	226.8	5.5
12:10:00	231	5.3
12:11:00	249.2	6.5
12:12:00	268	8
12:13:00	356.9	12.7
12:14:00	437.1	15.1
12:15:00	350	14.9
Average	301.2	11.3
Minimum	193.8	5.3
Maximum	588.1	32.8

Test #4

2 of 2

METHOD 2 VOLUMETRIC FLOW DATA

Project No:	M22E0133		
Company:	Ferrara Pan Candies	**Run No.:**	2
Plant:	Forest Park, IL	**Date:**	6/26/2003
Source:	Oxidizer Inlet	**Start Time:**	07:13
Source Condition:		**End Time:**	07:21
Pitot ID:	841A	**RM Testers:**	JLH
Pitot Coefficient:	0.84		

Test Parameters	
P_{bar} - Barometric pressure, inches Hg	29.79
P_g - Stack Pressure, inches of H_2O	-6.00
P_s - Absolute stack pressure, inches Hg	29.35
t_s - Average stack temperature, °F	73.7
% CO_2	0.0
% O_2	20.9
% N_2	79.1
Md - dry basis lb/lb mole	28.836
Ms - wet basis lb/lb mole	28.619
Stack Diameter, Feet	2.50
Cross Sectional Area of Stack, Ft^2	4.91
Bws - Moisture content fraction	0.020

Moisture Determination	
Method Used:	WB/DB
Wet Bulb (Deg F):	67.00
Dry Bulb (Deg F):	73.00

Port Point	ΔP (in. H_2O)	Sqrt. ΔP	Temp (°F)	Velocity (V)
A 01	0.25	0.5000	76.0	28.68
A 02	0.26	0.5099	75.0	29.22
A 03	0.25	0.5000	75.0	28.66
A 04	0.24	0.4899	74.0	28.05
A 05	0.19	0.4359	74.0	24.96
A 06	0.15	0.3873	73.0	22.16
A 07	0.14	0.3742	74.0	21.42
A 08	0.29	0.5385	75.0	30.86

Port Point	ΔP (in. H_2O)	Sqrt. ΔP	Temp (°F)	Velocity (V)
B 01	0.18	0.4243	74.0	24.29
B 02	0.20	0.4472	74.0	25.61
B 03	0.20	0.4472	73.0	25.58
B 04	0.23	0.4796	73.0	27.43
B 05	0.21	0.4583	73.0	26.21
B 06	0.20	0.4472	72.0	25.56
B 07	0.19	0.4359	72.0	24.91
B 08	0.19	0.4359	72.0	24.91

Method 2 Results	
Average ΔP	0.2106
Average Sqrt ΔP	0.4569
Average Velocity Vs (ft/sec)	26.149
Q - ACFM	7,701
Qsd - DSCFM	7,324
Qs - SCFM	7,474
Qs - SCFH	448,431

METHOD 2 VOLUMETRIC FLOW DATA

Project No:	M22E0133		
Company:	Ferrara Pan Candies	**Run No.:**	~~5~~ 4
Plant:	Forest Park, IL	**Date:**	6/26/2003
Source:	Oxidizer Inlet	**Start Time:**	11.27
Source Condition:		**End Time:**	11 34
Pitot ID:	841A	**RM Testers:**	JLH
Pitot Coefficient:	0 84		

Test Parameters	
P_{bar} - Barometric pressure, inches Hg	29 79
P_g - Stack Pressure, inches of H_2O	-6 00
P_s - Absolute stack pressure, inches Hg	29.35
t_s - Average stack temperature, °F	77.9
% CO_2	0 0
% O_2	20 9
% N_2	79.1
Md - dry basis lb/lb mole	28.836
Ms - wet basis lb/lb mole	28.619
Stack Diameter, Feet	2.50
Cross Sectional Area of Stack, Ft^2	4.91
Bws - Moisture content fraction	0.020

Moisture Determination	
Method Used:	WB/DB
Wet Bulb (Deg F):	67.00
Dry Bulb (Deg F):	73 00

Port	Point	ΔP (in. H_2O)	Sqrt. ΔP	Temp (°F)	Velocity (V)
A	01	0 22	0.4690	80 0	27.01
A	02	0 23	0.4796	81.0	27.64
A	03	0 21	0.4583	80 0	26.39
A	04	0.19	0.4359	80 0	25.10
A	05	0 16	0.4000	80 0	23.03
A	06	0 13	0.3606	79 0	20.74
A	07	0 13	0.3606	79 0	20.74
A	08	0 15	0.3873	79.0	22.28

Port	Point	ΔP (in. H_2O)	Sqrt. ΔP	Temp (°F)	Velocity (V)
B	01	0 18	0.4243	77.0	24.36
B	02	0 19	0.4359	77 0	25.03
B	03	0.19	0.4359	77.0	25.03
B	04	0.20	0.4472	77 0	25.68
B	05	0.17	0.4123	76 0	23.65
B	06	0.16	0.4000	76 0	22.95
B	07	0 15	0.3873	76 0	22.22
B	08	0.17	0.4123	73 0	23.59

Method 2 Results	
Average ΔP	0.1769
Average Sqrt ΔP	0.4191
Average Velocity Vs (ft/sec)	24.081
Q - ACFM	7,092
Qsd - DSCFM	6,692
Qs - SCFM	6,828
Qs - SCFH	409,707

METHOD 2 VOLUMETRIC FLOW DATA

Project No:	M22E0133	**Operating Level:**	Need to Enter
Company:	Ferrara Pan Candies	**Run No.:**	2
Plant:	Forest Park, IL	**Date:**	6/26/2003
Source:	Oxidizer Outlet	**Start Time:**	07:25
Pitot ID:	841A	**End Time:**	07:30
Pitot Coefficient:	0.84	**RM Testers:**	JLH

Test Parameters	
P_{bar} - Barometric pressure, inches Hg	29.79
P_g - Stack Pressure, inches of H_2O	-0.30
P_s - Absolute stack pressure, inches Hg	29.77
t_s - Average stack temperature, °F	202.9
% CO_2	0.0
% O_2	20.9
% N_2	79.1
Md - dry basis lb/lb mole	28.84
Ms - wet basis lb/lb mole	28.521756
Stack Diameter, Feet	2.50
Cross Sectional Area of Stack, Ft^2	4.91

Moisture Determination	
Meter Calibration:	0.993
Initial Meter Volume:	248.300
Final Meter Volume:	250.756
Meter Temperature:	87.50
Meter Volume Vm(std):	2.343
Meter Volume Vw(std):	0.071
Delta H:	0.05
Train Initial Wt:	521.700
Train Final Wt:	523.200
Condensate Initial Vol:	0.000
Condensate Final Vol:	0.000
Bws - Moisture content fraction	**0.029**

Port Point	ΔP (in. H_2O)	Sqrt. ΔP	Temp (°F)	Velocity (V)
A 01	0.22	0.4690	196.0	29.61
A 02	0.24	0.4899	198.0	30.97
A 03	0.27	0.5196	201.0	32.92
A 04	0.25	0.5000	204.0	31.75
A 05	0.15	0.3873	204.0	24.60
A 06	0.29	0.5385	205.0	34.22
A 07	0.29	0.5385	208.0	34.30
A 08	0.30	0.5477	205.0	34.81
B 01	0.33	0.5745	206.0	36.54
B 02	0.38	0.6164	205.0	39.18
B 03	0.30	0.5477	207.0	34.86
B 04	0.26	0.5099	207.0	32.46
B 05	0.28	0.5292	203.0	33.58
B 06	0.25	0.5000	200.0	31.66
B 07	0.25	0.5000	199.0	31.63
B 08	0.18	0.4243	198.0	26.82

Port	Point	ΔP (in. H_2O)	Sqrt. ΔP	Temp (°F)	Velocity (V)

Method 2 Results	
Average ΔP	0.2650
Average Sqrt ΔP	0.5120
Average Velocity Vs (ft/sec)	32.482
No WAF Applied to this Test	
Q - ACFM	9,567
Qsd - DSCFM	7,362
Qs - SCFM	7,581
Qs - SCFH	454,884

METHOD 2 VOLUMETRIC FLOW DATA

Project No:	M22E0133	**Operating Level:**	Need to Enter
Company:	Ferrara Pan Candies	**Run No.:**	4
Plant:	Forest Park, IL	**Date:**	6/26/2003
Source:	Oxidizer Outlet	**Start Time:**	08:40
Pitot ID:	841A	**End Time:**	08:46
Pitot Coefficient:	0.84	**RM Testers:**	JLH

Test Parameters	
P_{bar} - Barometric pressure, inches Hg	29.79
P_g - Stack Pressure, inches of H_2O	-0.30
P_s - Absolute stack pressure, inches Hg	29.77
t_s - Average stack temperature, °F	199.3
% CO_2	0.0
% O_2	20.9
% N_2	79.1
Md - dry basis lb/lb mole	28.84
Ms - wet basis lb/lb mole	28.54
Stack Diameter, Feet	2.50
Cross Sectional Area of Stack, Ft^2	4.91

Moisture Determination	
Meter Calibration:	0.993
Initial Meter Volume:	250.851
Final Meter Volume:	253.316
Meter Temperature:	87.00
Meter Volume Vm(std):	2.354
Meter Volume Vw(std):	0.066
Delta H:	0.05
Train Initial Wt:	523.200
Train Final Wt:	524.600
Condensate Initial Vol:	0.000
Condensate Final Vol:	0.000
Bws - Moisture content fraction	**0.027**

Port Point	ΔP (in. H_2O)	Sqrt. ΔP	Temp (°F)	Velocity (V)
A 01	0.20	0.4472	198.0	28.26
A 02	0.23	0.4796	200.0	30.35
A 03	0.24	0.4899	201.0	31.03
A 04	0.23	0.4796	202.0	30.40
A 05	0.24	0.4899	201.0	31.03
A 06	0.28	0.5292	203.0	33.57
A 07	0.27	0.5196	207.0	33.06
A 08	0.26	0.5099	200.0	32.27
B 01	0.24	0.4899	200.0	31.01
B 02	0.26	0.5099	199.0	32.25
B 03	0.24	0.4899	198.0	30.96
B 04	0.22	0.4690	198.0	29.64
B 05	0.21	0.4583	198.0	28.96
B 06	0.19	0.4359	198.0	27.55
B 07	0.17	0.4123	193.0	25.96
B 08	0.16	0.4000	193.0	25.18

Port	Point	ΔP (in. H_2O)	Sqrt. ΔP	Temp (°F)	Velocity (V)

Method 2 Results	
Average ΔP	0.2275
Average Sqrt ΔP	0.4756
Average Velocity Vs (ft/sec)	30.080
No WAF Applied to this Test	
Q - ACFM	8,859
Qsd - DSCFM	6,868
Qs - SCFM	7,059
Qs - SCFH	423,519

CALIBRATION PROCEDURES

PITOT TUBES

The pitot tubes used during this test program are fabricated according to the specification described and illustrated in the *Code of Federal Regulations*, Title 40, Part 60, Appendix A, Methods 1 through 5 as published in the *Federal Register*, Volume 42, No. 160; hereafter referred to by the appropriate method number. The pitot tubes comply with the alignment specifications in Method 2, Section 4; and the pitot tube assemblies are in compliance with specifications in the same section.

Pitot tube assemblies are calibrated in accordance with Method 2, Section 4, against a standard hemispherical pitot utilizing a wind tunnel meeting the specification in Method 2, Section 4.1.2.

TEMPERATURE SENSING DEVICES

The potentiometer and thermocouples are calibrated against a mercury thermometer in a calibration well. Alternatively, readings are checked utilizing a NBS traceable millivolt source.

DRY GAS METERS

The test meters are calibrated according to Method 5, Section 5.3 and "Procedures for Calibrating and Using Dry Gas Volume Meters as Calibration Standards" by P.R. Westlin and R.T. Shigehara, March 10, 1978.

ANALYTICAL BALANCE

The accuracy of the analytical balance is checked with Class S, Stainless Steel Type 303 weights manufactured by F. Hopken and Son, Jersey City, New Jersey.

METER BOX CALIBRATION

Dry Gas Meter No.	F19	Date:	06-12-03
Standard Meter No.	2962156	Calibrated By:	PSH
Standard Meter (Yr)	0.9946	Barometric Pressure :	29.14

	Run Number	Orifice Setting in H20 Chg (H)	Standard Meter Gas Volume Vr	Dry Meter Gas Volume Vd	Standard Meter Temp. F tr	Dry Gas Meter Inlet Temp. F tdi	Dry Gas Meter Outlet Temp. F tdo	Dry Gas Meter Avg. Temp. F td	Time Min.	Time Sec.	Y
Final			78.524	35.434	70	84	78				
Inital			76.137	32.984	70	81	76				
Difference	1	0.10	2.387	2.450	70	83	77	80	20		0.992
Final			80.906	37.882	70	86	79				
Inital			78.524	35.434	70	84	78				
Difference	2	0.10	2.382	2.448	70	85	79	82	20		0.994
Final			83.291	40.342	70	87	80				
Inital			80.906	37.882	70	86	79				
Difference	3	0.10	2.385	2.460	70	87	80	83	20		0.993

Average 0.993

SOURCE IDENTIFICATION: Ferrara DAN / INLET DATE: 6-26-03

RUN: 1-3 OPERATOR: Stu

SPAN: 0-1000

CALIBRATION SUMMARY
(METHOD 25A)

	Identification	Cylinder No.	Name of Gas	Time	Cylinder Value (Units)	Analyzer Response Unit	Calibration Error (% of cal value)	Drift (% of span)
Pre CAL	Zero Gas		zero	534	0.0	2.8		
	Low	IL 3481	C_3H_8	542	286.7	288.2		
	Mid	ALM007644	↓	548	496.1	497.1		
	High	ALM014641		537	832.0	831.2		
POST 1	Zero Gas		zero	704	0.0	0.2		
	Low		C_3H_8	708	286.7	287.6		
	Mid		↓					
	High							
POST 2	Zero Gas		Zero	815	0.0	-0.3		
	Low		C_3H_8	819	286.7	284.7		
	Mid		↓					
	High							
POST 3	Zero Gas		Zero	938	0.0	-0.6		
	Low		C_3H_8	942	286.7	276.6		
	Mid		↓					
	High							
POST 4	Zero Gas		Zero	1219	0.0	0.0		
	Low		C_3H_8	1223	286.7	282.5		
	Mid		↓					
	High							
	Zero Gas							
	Low							
	Mid							
	High							

Mostardi Platt performs all calibrations through the complete sampling system and, therefore, no sample system bias exists and none is applied to the results.

$$\text{Calibration Error} = \left[\frac{\text{Analyzer Response} - \text{Cylinder Value}}{\text{Cylinder Value}}\right] \times 100 \text{ (must be } < 5\%)$$

$$\text{Drift} = \left[\frac{\text{Pretest Analyzer Response} - \text{Post Test Analyzer Response}}{\text{Span Value}}\right] \times 100 \text{ (must be } < \pm 3\%)$$

VOC inlet 1 min ppmv Avg Bin#001
VOC outlet 1 min ppm Avg Bin#002

6/26/2003		
5:30:00	3.4	0.2
5:31:00	3.2	0.2
5:32:00	3.2	0.1
5:33:00	2.8	0.1
5:34:00	2.8	0
5:35:00	435.6	0
5:36:00	828.8	0
5:37:00	831.2	0
5:38:00	43.5	0
5:39:00	3.4	0
5:40:00	276.4	12.6
5:41:00	287.3	88.9
5:42:00	288.2	89.2
5:43:00	39.6	90.2
5:44:00	5.6	23.4
5:45:00	5.2	28.9
5:46:00	459.3	29.2
5:47:00	498.2	29.4
5:48:00	497.1	10.8
5:49:00	65.2	0.5
5:50:00	8.4	19.3
5:51:00	7.4	49.2
5:52:00	6.9	49.9
5:53:00	6	38.6
5:54:00	5.2	0.8
5:55:00	98.1	2.8
5:56:00	272.2	12.1
5:57:00	250.5	11.6
5:58:00	235.1	11.2
5:59:00	217.9	11.4
6:00:00	206.6	13.6

Linearity /Pre l

VOC inlet 1 min ppmv Avg Bin#001
VOC outlet 1 min ppm Avg Bin#002

6/26/2003		
8:10:00	215.5	7.8
8:11:00	306.7	3.6
8:12:00	430.6	-0.2
8:13:00	238.5	2.5
8:14:00	2.1	28.6
8:15:00	-0.3	29.5
8:16:00	137.1	29.7
8:17:00	353.3	29.8
8:18:00	285.2	13.2
8:19:00	284.7	11.9
8:20:00	331.1	11.5

Post 2 / Pre 3

VOC inlet 1 min ppmv Avg Bin#001
VOC outlet 1 min ppm Avg Bin#002

6/26/2003		
12:15:00	350	14.9
12:16:00	326.6	10
12:17:00	302.8	9.6
12:18:00	53.8	29.3
12:19:00	0	29.5
12:20:00	171	18
12:21:00	275.8	-0.1
12:22:00	281.7	0.2
12:23:00	282.5	0.1

Run 4

RATA CLASS

Scott Specialty Gases

Dual-Analyzed Calibration Standard

1290 COMBERMERE STREET,TROY,MI 48083 Phone: 248-589-2950 Fax: 248-589-2134

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
1290 COMBERMERE STREET
TROY,MI 48083

P.O. No.: MOSTARDI PLATT STOCK
Project No.: 05-98085-014

Customer

SCOTT SPECIALTY GASES C/C

MOSTARDI PLATT STOCK
868 SIVERT DRIVE
WOOD DALE IL 60191

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure G-1; September, 1997.

Cylinder Number: ALM007644 **Certification Date:** 10/14/02 **Exp. Date:** 10/13/2005
Cylinder Pressure*:** 1900 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ANALYTICAL ACCURACY**	TRACEABILITY
PROPANE	496.1	PPM	+/- 1%	Direct NIST and NMi
AIR		BALANCE		

*** Do not use when cylinder pressure is below 150 psig.
** Analytical accuracy is based on the requirements of EPA Protocol Procedure G1, September 1997.
Product certified as +/- 1% analytical accuracy is directly traceable to NIST or NMI standards.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 1200	8/01/05	AAL14642	1193. PPM	PROPANE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
VARIAN/6000/08963016A	09/19/02	FLAME IONIZATION

ANALYZER READINGS

(Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

First Triad Analysis **Second Triad Analysis** **Calibration Curve**

PROPANE

First Triad Analysis:

Date:10/14/02	Response Unit:AREA	
Z1=0.00000	R1=4564720.	T1=1896823.
R2=4560784.	Z2=0.00000	T2=1896926.
Z3=0.00000	T3=1898262.	R3=4557717.
Avg. Concentration:	496.1	PPM

Calibration Curve:

Concentration=A+Bx+Cx2+Dx3+Ex4	
r=1.000	
Constants:	A=-0.2110969
B=2.58E-4	C=0.0
D=0.0	E=0.0

APPROVED BY: [signature]

RATA CLASS

Scott Specialty Gases

Dual-Analyzed Calibration Standard

1290 COMBERMERE STREET,TROY,MI 48083 Phone: 248-589-2950 Fax: 248-589-2134

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
1290 COMBERMERE STREET
TROY,MI 48083

P.O. No.: MOPLATT STOCK
Project No.: 05-94665-002

Customer

SCOTT SPECIALTY GASES C/C

MOSTARDI PLATT STOCK
868 SIVERT DRIVE
WOOD DALE IL 60191

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure G-1; September, 1997.

Cylinder Number: ALM024491 **Certification Date:** 7/30/02 **Exp. Date:** 7/29/2005
Cylinder Pressure*:** 1900 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ANALYTICAL ACCURACY**	TRACEABILITY
PROPANE	29.94	PPM	+/- 1%	Direct NIST and NMi
AIR		BALANCE		

*** Do not use when cylinder pressure is below 150 psig.
** Analytical accuracy is based on the requirements of EPA Protocol Procedure G1, September 1997.
Product certified as +/- 1% analytical accuracy is directly traceable to NIST or NMI standards.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 1668	8/01/05	ALM010723	99.50 PPM	PROPANE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
VARIAN/6000/08963016A	07/30/02	FLAME IONIZATION

ANALYZER READINGS

(Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

First Triad Analysis **Second Triad Analysis** **Calibration Curve**

PROPANE

Date:07/31/02	Response Unit:HT	
Z1=0.00000	R1=758808.0	T1=228270.0
R2=761699.0	Z2=0.00000	T2=228288.0
Z3=0.00000	T3=228556.0	R3=765043.0
Avg. Concentration:	29.94	PPM

Concentration=A+Bx+Cx2+Dx3+Ex4	
r=.999995	
Constants:	A=0.0804372
B=1.31E-4	C=0
D=0	E=0

Special Notes: SEND CERT WITH CERT

APPROVED BY:

RATA CLASS

Dual-Analyzed Calibration Standard

1290 COMBERMERE STREET,TROY,MI 48083 Phone: 248-589-2950 Fax: 248-589-2134

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
1290 COMBERMERE STREET
TROY,MI 48083

P.O. No.: MOSTARDI PLATT STOCK
Project No.: 05-97588-013

Customer

SCOTT SPECIALTY GASES C/C

MOSTARDI PLATT STOCK
868 SIVERT DRIVE
WOOD DALE IL 60191

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure G-1; September, 1997.

Cylinder Number: ALM065384 **Certification Date:** 07Oct2002 **Exp. Date:** 06Oct2005
Cylinder Pressure*:** 1900 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ANALYTICAL ACCURACY**	TRACEABILITY
PROPANE	89.82	PPM	+/- 1%	Direct NIST and NMi
AIR		BALANCE		

*** Do not use when cylinder pressure is below 150 psig.
** Analytical accuracy is based on the requirements of EPA Protocol Procedure G1, September 1997.
Product certified as +/- 1% analytical accuracy is directly traceable to NIST or NMI standards.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 1668	01Aug2005	ALM010723	99.50 PPM	PROPANE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
VARIAN/6000/08963016A	12Sep2002	FLAME IONIZATION

ANALYZER READINGS

(Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

First Triad Analysis **Second Triad Analysis** **Calibration Curve**

PROPANE

Date: 07Oct2002	Response Unit:AREA	
Z1=0.00000	R1=3832630.	T1=3450493.
R2=3830647.	Z2=0.00000	T2=3451770.
Z3=0.00000	T3=3454418.	R3=3820000.
Avg. Concentration:	89.82	PPM

Concentration=A+Bx+Cx2+Dx3+Ex4	
r=.999996	
Constants:	A=-0.0276201
B=2.53E-5	C=0.0
D=0.0	E=0.0

APPROVED BY: ____________________

PITOT TRAVERSE DATA

Project: Ferrara

Location: Oxidizer Inlet

Date: 6-26-03 Test No: 2 Time: 725 - 730

Point No.	ΔP	√ΔP	t_s	α	Point No.	ΔP	√ΔP	t_s	α
1-1	.25		76						
2	.26		75						
3	.25		75						
4	.24		74						
5	.19		74						
6	.15		73						
7	.14		74						
8	.29		75						
2-1	.18		74						
2	.20		74						
3	.20		73						
4	.23		73						
5	.21		73						
6	.20		72						
7	.19		72						
8	.19		72						
	.4569		74						

P_{bar} 29.79 "Hg Static -.3 "H_2O P_g ___ "Hg P_s ___ "Hg Pitot ID 841A C_p .840 Temp. ID F19

0.44 × 0 %CO_2 = ___ √ΔP ___ t_s ___ °F T ___ °R Flue Area 4.908 ft^2

0.32 × 20.9 %O_2 = + ___ Duct Dimensions 30''

0.28 × ___ %N_2 = + ___ B_{ws} ___ 1 - B_{ws} ___ Disturbance: Upstream ___

(___ Md × ___ 1-Bws) + (18 × ___ Bws) = ___ (Ms) Downstream ___

$$v_s = 85.49 \times \_\_\_\_ Cp \times \sqrt{\frac{(\_\_\_\_)Ts\ °R}{\_\_\_\_ Ms \times \_\_\_\_ Ps}} \times 26.012\ \sqrt{\Delta P} = \_\_\_\_ \text{ ft/sec (Vs)}$$

Q_{acfm} = ___ Vs × ___ Flue Area × 60 = 7660 acfm Port Length ___ Inches

$$Q_{scfm} = 17.647 \times ACFM \times \frac{Ps}{Ts\ °R} = 7540 \text{ SCFM}$$

$$Q_{dscfm} = 17.647 \times ACFM \times \frac{Ps}{Ts\ °R} \times (1\text{-Bws}) = 7321 \text{ DSCFM}$$

Pre-test leak check ✓ "H_2O

Post-test leak check ✓ "H_2O 61 Data Taken By: JCH

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Form 1012

115

PITOT TRAVERSE DATA

Project: Ferrara Candy

Location: Oxidizer Inlet

Date: 6-26-03 Test No: 4 Time: 1127 - 1134

Point No.	ΔP	$\sqrt{\Delta P}$	t_s	α	Point No	ΔP	$\sqrt{\Delta P}$	t_s	α
1-1	.22		80						
2	.23		81						
3	.21		80						
4	.19		80						
5	.16		80						
6	.13		79						
7	.13		79						
8	.15		79						
2-1	.18		77						
2	.19		77						
3	.19		77						
4	.20		77						
5	.17		76						
6	.16		76						
7	.15		76						
8	.17		73						
	.4191		80						

P_{bar} 29.79 "Hg Static -6 "H_2O P_g____ "Hg P_s____ "Hg Pitot ID____ C_p____ Temp. ID____

0.44 × 0 %CO_2 = ____ $\sqrt{\Delta P}$ ____ t_s____ °F T____ °R Flue Area ____ ft^2

0.32 × 20.9 %O_2 = +____ Duct Dimensions ____

0.28 × ____ %N_2 = +____ B_{ws}____ 1 - B_{ws}____ Disturbance: Upstream ____

(____ Md × ____ 1-Bws) + (18 × ____ Bws) = ____ (Ms) Downstream ____

$$v_s = 85.49 \times \_\_\_\_ Cp \times \sqrt{\frac{(\_\_\_\_)Ts\ °R}{\_\_\_\_ Ms \times \_\_\_\_ Ps}} \times \_\_\_\_ \sqrt{\Delta P} = 24.1164 \text{ ft/sec (Vs)}$$

Q_{acfm} = ____ Vs × ____ Flue Area × 60 = 7100 acfm Port Length ____ Inches

Q_{scfm} = 17.647 × ACFM × $\frac{Ps}{Ts\ °R}$ = 6813 SCFM

Q_{dscfm} = 17.647 × ACFM × $\frac{Ps}{Ts\ °R}$ × (1-Bws) = 6698 DSCFM

Pre-test leak check ✓ "H_2O

Post-test leak check ✓ "H_2O

WB 67
OB 73
Bws = .017

Data Taken By: JLH

Form 1012

PITOT TRAVERSE DATA

Project: Ferrera

Location: Oxidizer Outlet

Date: 6-26-03 Test No: 2 Time: 713 - 721

Point No.	ΔP	$\sqrt{\Delta P}$	t_s	α	Point No.	ΔP	$\sqrt{\Delta P}$	t_s	α
1-1	.22		196						
2	.24		198						
3	.27		201						
4	.25		204						
5	.15		204						
6	.29		205						
7	.29		208						
8	.30		205						
2-1	.33		206						
2	.38		205						
3	.30		207						
4	.26		207						
5	.28		203						
6	.25		200						
7	.25		199						
8	.18		198						
	.5160		203						

P_{bar} 29.78 "Hg Static -6 "H_2O P_g ____ "Hg P_s 29.35 "Hg Pitot ID 841A C_p .840 Temp. ID F15

0.44 × 6 $\%CO_2$ = ______ $\sqrt{\Delta P}$ ______ t_s ______ °F T ______ °R Flue Area 4.908 ft^2

0.32 × 20.9 $\%O_2$ = + ______ Duct Dimensions 30

0.28 × ______ $\%N_2$ = + ______ B_{ws} ______ 1 - B_{ws} ____ Disturbance: Upstream ______

(______ Md × ______ 1-Bws) + (18 × ______ Bws) = ______ (Ms) Downstream ______

$$v_s = 85.49 \times \_\_\_\_ Cp \times \sqrt{\frac{(\_\_\_\_\_\_)Ts\ °R}{\_\_\_\_ Ms \times \_\_\_\_ Ps}} \times \_\_\_\_ \sqrt{\Delta P} =$$ 32.6393 ft/sec (Vs)

Q_{acfm} = ______ Vs × ______ Flue Area × 60 = 9611 acfm Port Length ______ Inches

$Q_{scfm} = 17.647 \times ACFM \times \frac{Ps}{Ts\ °R}$ = 7512 SCFM

$Q_{dscfm} = 17.647 \times ACFM \times \frac{Ps}{Ts\ °R} \times (1\text{-}Bws) =$ 7384 DSCFM

Pre-test leak check ✓ "H_2O

Post-test leak check ✓ "H_2O

WB 67

DB 73

Data Taken By: JLH

B_{ws} = .017

Form 1012

PITOT TRAVERSE DATA

Project:

Location: Outlet Oxidizer

Date: Test No: 4 Time: 840 - 846

Point No.	ΔP	√ΔP	t_s	α	Point No.	ΔP	√ΔP	t_s	α
1-1	.20		198						
2	.23		200						
3	.24		201						
4	.23		202						
5	.24		201						
6	.28		203						
7	.27		207						
8	.26		200						
2-1	.24		200						
2	.26		199						
3	.24		198						
4	.22		198						
5	.21		198						
6	.19		198						
7	.17		193						
8	.16		193						
	.4756		199						

P_{bar} 29.79 "Hg Static -.3 "H_2O P_g ____ "Hg P_s ____ "Hg Pitot ID 841A C_p .840 Temp. ID F19

0.44 × 0 %CO_2 = ____ √ΔP ____ t_s ____ °F T ____ °R Flue Area 4.905 ft^2

0.32 × 20.9 %O_2 = + ____ Duct Dimensions 30"

0.28 × ____ %N_2 = + ____ B_{ws} ____ 1 - B_{ws} ____ Disturbance: Upstream ____

(____ Md × ____ 1-Bws) + (18 × ____ Bws) = ____ (Ms) Downstream ____

$$v_s = 85.49 \times \_\_\_\_ Cp \times \sqrt{\frac{(\_\_\_\_\_\_\_)Ts\ °R}{\_\_\_\_ Ms \times \_\_\_\_ Ps}} \times \_\_\_\_ \sqrt{\Delta P} = 30.0101 \text{ ft/sec (Vs)}$$

Q_{acfm} = ____ Vs × ____ Flue Area × 60 = 8855 acfm Port Length ____ Inches

$$Q_{scfm} = 17.647 \times ACFM \times \frac{Ps}{Ts\ °R} = 7062 \text{ SCFM}$$

$$Q_{dscfm} = 17.647 \times ACFM \times \frac{Ps}{Ts\ °R} \times (1\text{-}Bws) = 6871 \text{ DSCFM}$$

Pre-test leak check ✓ "H_2O

Post-test leak check ✓ "H_2O Data Taken By: JLH

MOISTURE FIELD DATA SHEET

Project: Ferrara Candy Date: 6-26-03
Sampling Location: Oxidizer Outlet
Source Condition: Normal Monitor: Model
Dry Gas Meter No. F 19 Y = .993 Serial No.

Test (Run) No. 3 Barometric Pressure (P_{bar}) 29.79 in. Hg
Gas Temperature °F Static Pressure -.3 in. Hg

Orsat Analysis: %CO_2 %O_2

Clock Time 24 hour	Meter Volume (V_m) ft^3	Meter Gage Pressure (ΔH) in H_2O	Meter Temp. (t_m) °F	Impgr. Outlet Temp °F
820	250.84	.05	88/85	≤68°F
850	253.316	.05	89/86	Fully Fed
Avg.	2.465	.05	87	

(T_m) °R

Condensate / Silica Gel or Train

mls (V_f) 524.6 grams (W_f)
- mls (V_i) - 523.2 grams (W_i)
mls 1.4 grams
× 0.04707 = × 0.04715 =
ft^3 [$V_{wc(std)}$] + ft^3 [$V_{wsg(std)}$]
= ft^3 [$V_{w(std)}$]
$V_{m(std)}$ = ft^3

Water Vapor, proportion by volume

Leak Check: yes" yes"

B_{ws} = 0.027

Moisture correction factor: $1 - B_{ws}$ = 0.9727

Comments:

Test (Run) No. 5 Barometric Pressure (P_{bar}) in. Hg
Gas Temperature °F Static Pressure in. Hg

Orsat Analysis: %CO_2 %O_2

Clock Time 24 hour	Meter Volume (V_m) ft^3	Meter Gage Pressure (ΔH) in H_2O	Meter Temp. (t_m) °F	Impgr. Outlet Temp °F
1117	253.336	.05	89/86	
1147	255.805	.05	88/86	
Avg.	2.469	0.05	87.25	

(T_m) °R

Condensate / Silica Gel or Train

mls (V_f) 527.6 grams (W_f)
- mls (V_i) - 526.0 grams (W_i)
mls 1.4 grams
× 0.04707 = × 0.04715 =
ft^3 [$V_{wc(std)}$] + ft^3 [$V_{wsg(std)}$]
= ft^3 [$V_{w(std)}$]
$V_{m(std)}$ = ft^3

Water Vapor, proportion by volume

Leak Check: yes" yes"

B_{ws} = .027

Moisture correction factor: $1 - B_{ws}$ = .9727

Comments:

$$V_{m(std)} = 17.64\, V_m Y \frac{P_{bar} + \frac{DH}{13.6}}{T_m}$$

$$B_{ws} = \frac{V_{w(std)}}{V_{w(std)} + V_{m(std)}}$$

Operator JLH

Form 1047 GE Mostardi Platt

PROCEDURE T DATA SHEET

Project: Ferrara Pan Candies

Location: Big Chocolate Room

Date: 6/26/03

Sketch enclosure, all ducts, NDOs and potential VOC emission points on accompanying page. Label all dimensions.

Enclosure Designation: PTE

Control Devices (s):

Process(es) Enclosed:

NDO to VOC Emission Point

NDO	Dimensions	Equivalent Diameter	VOC Emission Point	Distances		Pass/ Fail?
				Minimum	Actual	
Door	1"x6.5'	0.830	Polisher	3.322	186"	Pass
Hole in Room	16"	1.396	Polisher	5.584	264"	Pass
Door	2"x3.5'	0.552	"	2.207	186"	Pass

$$\text{NDOs equivalent diameter} = \left(\frac{4 \times \text{area}}{\pi}\right)^{0.5}$$

Minimum Allowed Distance = 4 × Equivalent Diameter (NDO)

NDO to Exhaust (TTE only)

Exhaust Point	Dimensions	Equivalent Diameter	NDO	Dimensions	Equivalent Diameter	Distances		Pass/ Fail?
						Minimum	Actual	

$$\text{Equivalent diameter} = \left(\frac{4 \times \text{area}}{\pi}\right)^{0.5}$$

Minimum Allowed Distance = 4 × Equivalent Diameter (NDO or Exhaust Point)

PROCEDURE T DATA SHEET (cont.)

Direction of Air through NDO

Method used to check direction of airflow:

☐ Smoke Tubes ☑ Velometer ☐ Plastic Strips ☐ Other: ____________________

NDO	No.	Normally		Direction of Air Flow			NDO Required to be Normally Closed?	All Points?*
		Open	Closed	Into Enclosure	Out of Enclosure	Swirled		
Door			✓	✓			Yes	Yes
Hole		✓		✓			No	Yes

***Check to verify that airflow was checked at top, bottom, middle, and both sides of enclosure.**

Status of doors and windows

Are all access doors and windows whose areas are not included as NDOs closed during normal operation.
☐ Yes ☐ No

Capture of VOC Emissions

Does all exhaust ductwork go to control (for PTE) or to a point where it can be measured (for TTE).
☐ Yes ☐ No

PROCEDURE T DATA SHEET

Project: Ferrara Pan Candies
Location: West Polishing Room
Date: 6/26/03

Sketch enclosure, all ducts, NDOs and potential VOC emission points on accompanying page. Label all dimensions.

Enclosure Designation: ______
Process(es) Enclosed: ______
Control Devices (s): ______

NDO to VOC Emission Point

NDO	Dimensions	Equivalent Diameter	VOC Emission Point	Distances		Pass/ Fail?
				Minimum	Actual	
Door #1	1/4"x8.25 (2)	0.135 (x2)	Polishing Tubs	0.54'	7.5'	Pass
[illegible]	1 3/4"x12"	0.399	"	1.596'	7.5'	Pass
	1/8"x30"	0.182	"	0.728'	7.5'	Pass
Door #2	1/4"x8" (2)	0.135 (2)	"	0.54'	7.5'	Pass
	1/8"x30"	0.182	"	0.728'	7.5'	Pass

$$\text{NDOs equivalent diameter} = \left(\frac{4 \times \text{area}}{\pi}\right)^{0.5}$$

Minimum Allowed Distance = 4 × Equivalent Diameter (NDO)

NDO to Exhaust (TTE only)

Exhaust Point	Dimensions	Equivalent Diameter	NDO	Dimensions	Equivalent Diameter	Distances		Pass/ Fail?
						Minimum	Actual	

$$\text{Equivalent diameter} = \left(\frac{4 \times \text{area}}{\pi}\right)^{0.5}$$

Minimum Allowed Distance = 4 × Equivalent Diameter (NDO or Exhaust Point)

PROCEDURE T DATA SHEET (cont.)

Near Ratio [NDO Area/Total Enclosure Area]

NDO	Surface Area (FT^2)	Wall, Ceiling, or Floor Section	Surface Area (FT^2)
Door #1	0.014	89'10" × 10'	898.33
	0.014	32' × 10'	320.0
	0.105	32' × 10'	320.0
	0.026	13" × 10'	10.83
Door #2	0.014	49'1" × 10'	410.83
	0.014	38'9" × 10'	387.5
	0.026	89'10" × 32' (2)	5749.34
TOTAL NDO AREA= 0.233		TOTAL ENCLOSURE AREA= 8096.83	

NEAR ratio:

$$\frac{\text{NDOArea}}{\text{EnclosureArea}} = 0.00003$$

Allowable NEAR ratio ≤ 0.05,

Pass/Fail? Pass

Velocity of Air through NDO

Exhausted Air			Make Up Air	
Exhaust Point	SCFM	Controlled? (Y/N?)	Make up point	SCFM
TOTAL			TOTAL	

total NDO area - ________ ft^2
(from section 5.2)

$$\frac{\text{Exhaust scfm} - \sum \text{make up scfm}}{\text{NDO area } (ft^2)} = \text{\_\_\_\_\_\_\_\_ fpm}$$

fpm should be ≥ 200

pass/fail? ________________

Micromanometer Readings

Test #1: 0.008, 0.016

Test #2 = 0.022, 0.020

Test #3: 0.020, 0.018

Test #4: 0.022, 0.021

PROCEDURE T DATA SHEET (cont.)

Direction of Air through NDO

Method used to check direction of airflow:

☐ **Smoke Tubes** ☒ **Velometer** ☐ **Plastic Strips** ☐ **Other:** ______________________

NDO	No.	Normally		Direction of Air Flow			NDO Required to be Normally Closed?	All Points?*
		Open	Closed	Into Enclosure	Out of Enclosure	Swirled		
Door #1			✓	✓			Yes	Yes
Door #2			✓	✓				

***Check to verify that airflow was checked at top, bottom, middle, and both sides of enclosure.**

Status of doors and windows

Are all access doors and windows whose areas are not included as NDOs closed during normal operation.
☒ Yes ☐ No

Capture of VOC Emissions

Does all exhaust ductwork go to control (for PTE) or to a point where it can be measured (for TTE).
☒ Yes ☐ No

PROCEDURE T DATA SHEET

Project: Ferrara Pan Candies
Location: Ferrara Pan Chocolate Room
Date: 6/26/03

Sketch enclosure, all ducts, NDOs and potential VOC emission points on accompanying page. Label all dimensions.

Enclosure Designation: PTE
Process(es) Enclosed:
Control Devices (s):

NDO to VOC Emission Point

NDO	Dimensions	Equivalent Diameter	VOC Emission Point	Distances Minimum	Distances Actual	Pass/ Fail?
Door	1" x 6'	9.58"	Polisher	38.3"	144"	Pass

$$\text{NDOs equivalent diameter} = \left(\frac{4 \times \text{area}}{\pi}\right)^{0.5}$$

Minimum Allowed Distance = 4 × Equivalent Diameter (NDO)

NDO to Exhaust (TTE only)

Exhaust Point	Dimensions	Equivalent Diameter	NDO	Dimensions	Equivalent Diameter	Distances Minimum	Distances Actual	Pass/ Fail?

$$\text{Equivalent diameter} = \left(\frac{4 \times \text{area}}{\pi}\right)^{0.5}$$

Minimum Allowed Distance = 4 × Equivalent Diameter (NDO or Exhaust Point)

PROCEDURE T DATA SHEET (cont.)

Near Ratio [NDO Area/Total Enclosure Area]

NDO	Surface Area (FT^2)	Wall, Ceiling, or Floor Section	Surface Area (FT^2)
Door	0.5	56' x 10' (2)	560 (2)
		22'9" x 10'	227.5
		16'9" x 10'	167.5
		22'9" x 56' (2)	1274 (2)
TOTAL NDO AREA= 0.5		TOTAL ENCLOSURE AREA= 4063	

NEAR ratio:

$$\frac{\text{NDOArea}}{\text{EnclosureArea}} = \underline{0.0001}$$

Allowable NEAR ratio ≤ 0.05,

Pass/Fail? Pass

Velocity of Air through NDO

Exhausted Air			Make Up Air	
Exhaust Point	SCFM	Controlled? (Y/N?)	Make up point	SCFM
TOTAL			TOTAL	

total NDO area - ________ ft^2
(from section 5.2)

$$\frac{\text{Exhaust scfm - 1 make up scfm}}{\text{NDO area } (ft^2)} = \_\_\_\_\_\_\_\_ \text{fpm}$$

fpm should be ≥ 200

pass/fail? ________________

Micromanometer Readings
Test #1 = 0.011
Test #2 = 0.009
Test #3 = 0.012

Form 1099-2

Test #4 = 0.010

PROCEDURE T DATA SHEET (cont.)

Direction of Air through NDO

Method used to check direction of airflow:

☐ **Smoke Tubes** ☒ **Velometer** ☐ **Plastic Strips** ☐ **Other:** ______________________

NDO	No.	Normally		Direction of Air Flow			NDO Required to be Normally Closed?	All Points?*
		Open	Closed	Into Enclosure	Out of Enclosure	Swirled		
Door			✓	✓			Yes	Yes

***Check to verify that airflow was checked at top, bottom, middle, and both sides of enclosure.**

Status of doors and windows

Are all access doors and windows whose areas are not included as NDOs closed during normal operation.

☒ Yes ☐ No

Capture of VOC Emissions

Does all exhaust ductwork go to control (for PTE) or to a point where it can be measured (for TTE).

☒ Yes ☐ No

PROCEDURE T DATA SHEET

Project: Ferrara Pan Candies
Location: Mint Room
Date: 6/26/03

Sketch enclosure, all ducts, NDOs and potential VOC emission points on accompanying page. Label all dimensions.

Enclosure Designation: PTE
Control Devices (s):

Process(es) Enclosed:

NDO to VOC Emission Point

NDO	Dimensions	Equivalent Diameter	VOC Emission Point	Distances Minimum	Distances Actual	Pass/ Fail?
Door	1"x8'	11.1"	Polisher	44.4"	144"	Pass

$$\text{NDOs equivalent diameter} = \left(\frac{4 \times \text{area}}{\pi}\right)^{0.5}$$

Minimum Allowed Distance = 4 × Equivalent Diameter (NDO)

NDO to Exhaust (TTE only)

Exhaust Point	Dimensions	Equivalent Diameter	NDO	Dimensions	Equivalent Diameter	Distances Minimum	Distances Actual	Pass/ Fail?

$$\text{Equivalent diameter} = \left(\frac{4 \times \text{area}}{\pi}\right)^{0.5}$$

Minimum Allowed Distance = 4 × Equivalent Diameter (NDO or Exhaust Point)

PROCEDURE T DATA SHEET (cont.)

Near Ratio [NDO Area/Total Enclosure Area]

NDO	Surface Area (FT^2)	Wall, Ceiling, or Floor Section	Surface Area (FT^2)
Door	0.667	48'×12' (2)	576.0 (2)
		60'×12'	720.0
		52'×12'	624.0
		60'×48' (2)	2880 (2)
TOTAL NDO AREA= 0.667		TOTAL ENCLOSURE AREA= 8256	

NEAR ratio:

$$\frac{\text{NDOArea}}{\text{EnclosureArea}} = 0.00008$$

Allowable NEAR ratio ≤ 0.05,

Pass/Fail? Pass

Velocity of Air through NDO

Exhausted Air			Make Up Air	
Exhaust Point	SCFM	Controlled? (Y/N?)	Make up point	SCFM
TOTAL			TOTAL	

total NDO area - ________ ft^2
(from section 5.2)

$$\frac{\text{Exhaust scfm - 1 make up scfm}}{\text{NDO area } (ft^2)} = \text{\_\_\_\_\_\_ fpm}$$

fpm should be ≥ 200

pass/fail? ____________________

Micromanometer Reading
Test #1 - 0.012

Test #2 - 0.008

Test #3 = 0.007

Form 1099-2

Test #4 = 0.009

PROCEDURE T DATA SHEET (cont.)

Direction of Air through NDO

Method used to check direction of airflow:

☐ **Smoke Tubes** ☒ **Velometer** ☐ **Plastic Strips** ☐ **Other:** ______________________

NDO	No.	Normally		Direction of Air Flow			NDO Required to be Normally Closed?	All Points?*
		Open	Closed	Into Enclosure	Out of Enclosure	Swirled		
Door			✓	✓			Yes	Yes

***Check to verify that airflow was checked at top, bottom, middle, and both sides of enclosure.**

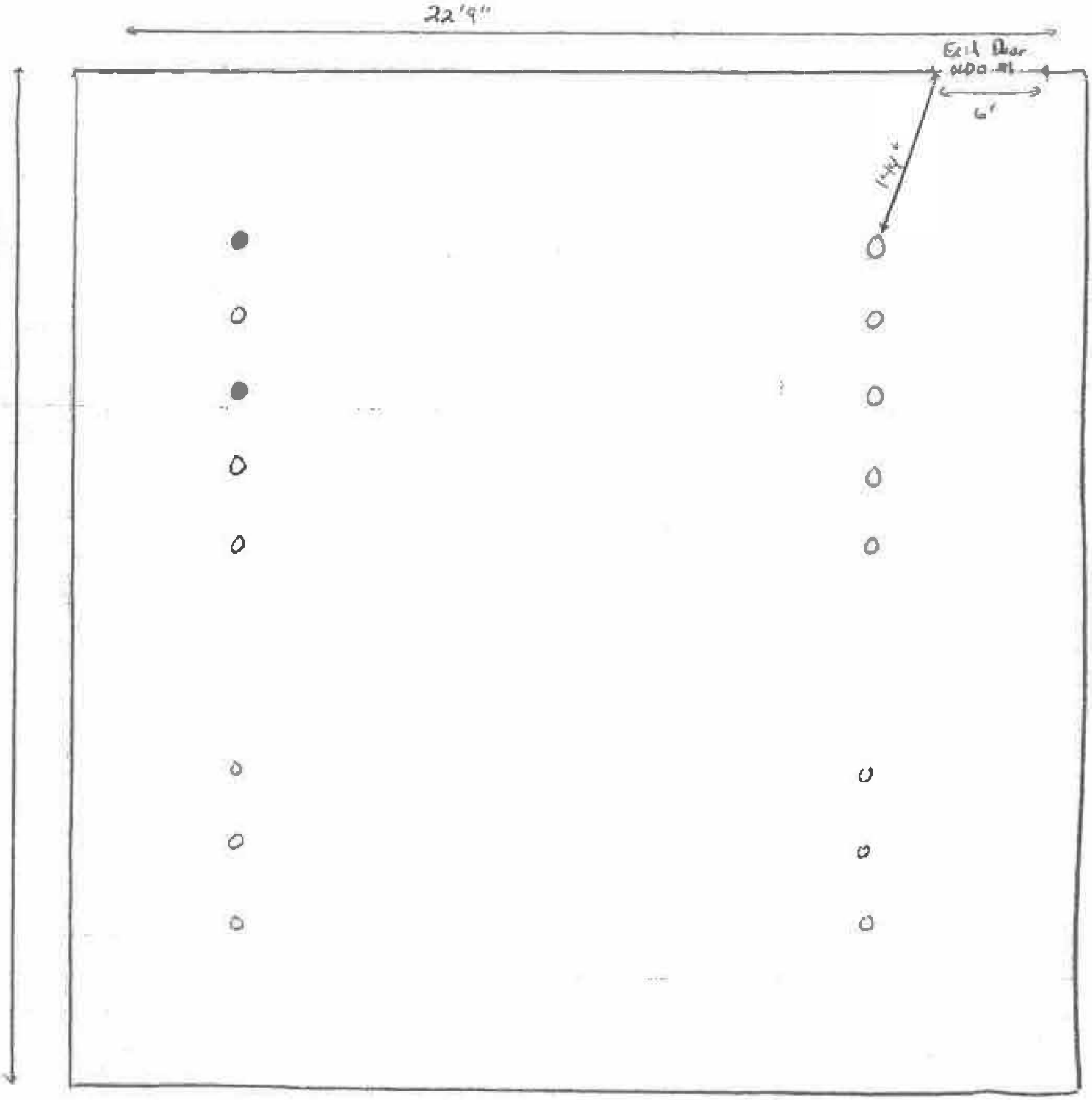
Status of doors and windows

Are all access doors and windows whose areas are not included as NDOs closed during normal operation.
☒ Yes ☐ No

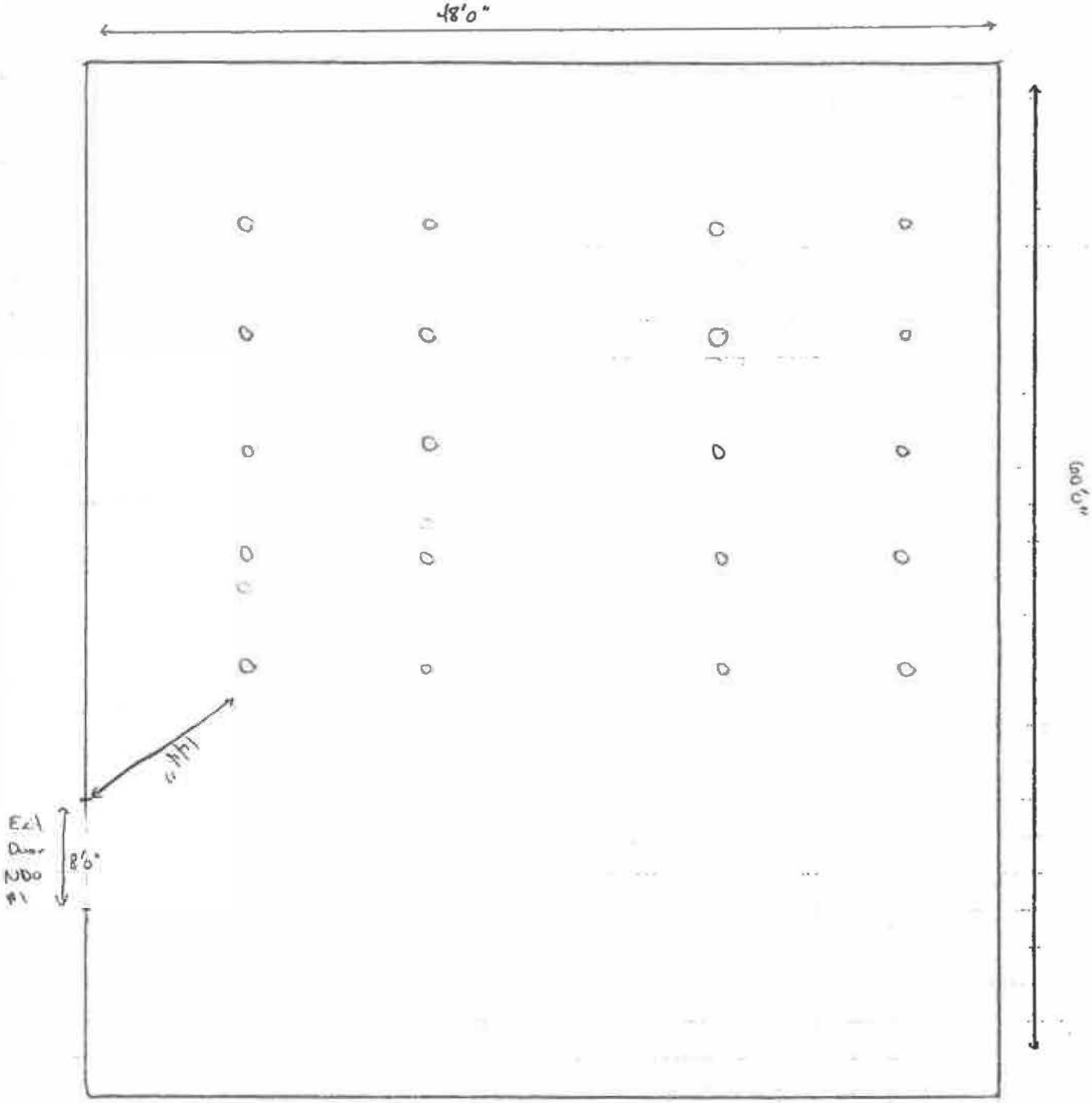
Capture of VOC Emissions

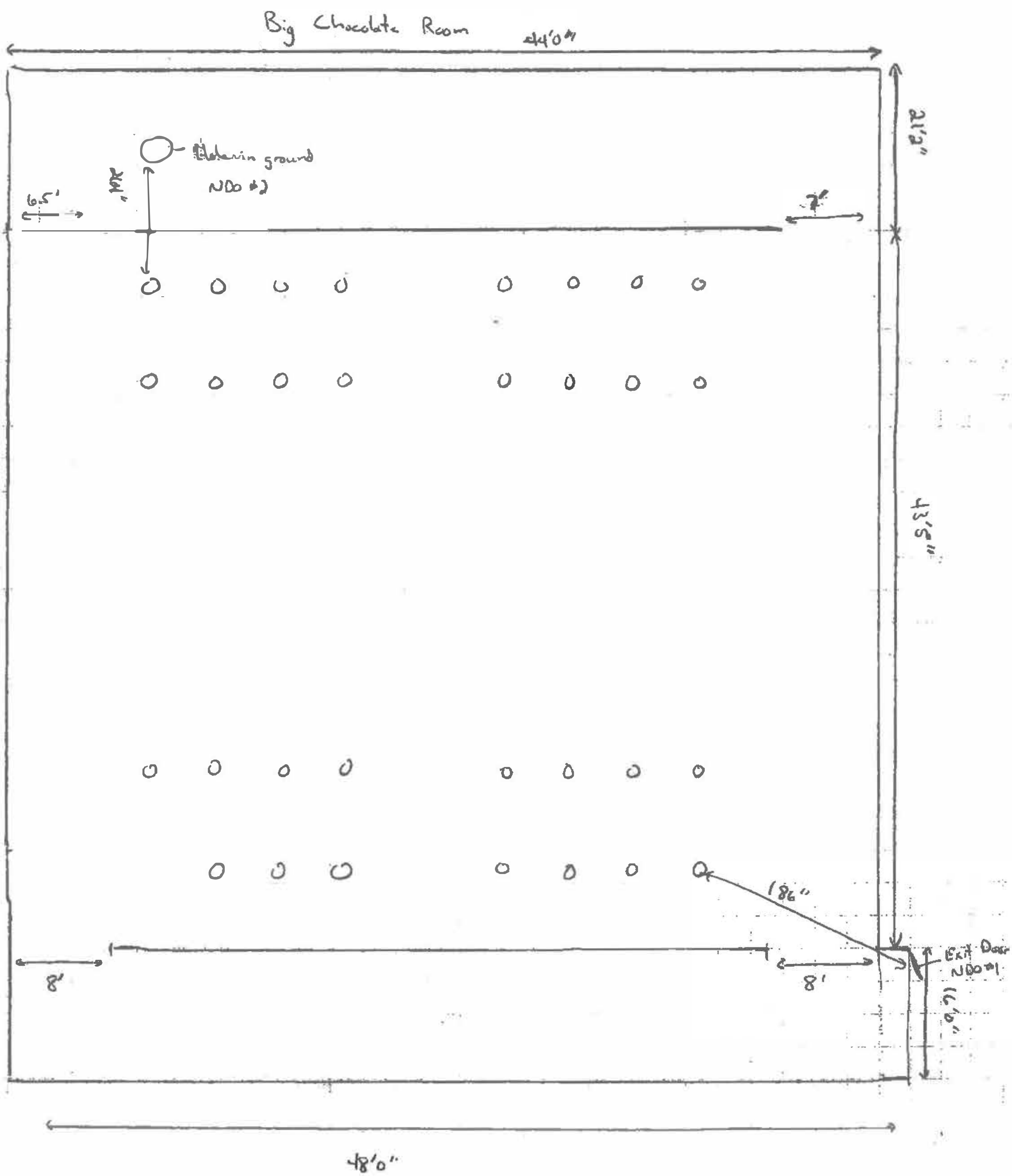
Does all exhaust ductwork go to control (for PTE) or to a point where it can be measured (for TTE).
☒ Yes ☐ No

Ferrara Pan Chocolate Room



Mint Room





Big Chocolate Room
44'0"
Hole in ground
NDO #2
6.5'
7'
21'2"
43'5"
186"
Exit Door
NDO #1
8'
8'
6'0"
48'0"

West Polishing Room